HANDBOOK OF ARCHITECTURE

Part II

Architectural styles

Volume IV

ROMANESQUE AND GOTHIC ARCHITECTURE

Part I. Military Architecture

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Darmstadt

1889

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Urbana. Ill.

1918

VOLUME 4. ROMANESQUE AND GOTHIC ARCHITECTURE.
Part 1. Military Architecture.
INTRODUCTION.

The surges of the migrations of the nations had ceased. The peoples from East and West had partly wandered back to their former seats, partly settled in the South, or they had combined with the former population into new states, and developed the foundations of new nationalities. In the central point of ancient civilization, in Italy the Lombards had maintained t themselves, but had been transformed more and more with the Romans into Italians, a people appearing with an individual character. In Spain the Visigoths, mixed with the old population, began to become Spaniards. The Franks seated in France also already mixed with the Gauls, commenced to become French, as they made the other German races subject to themselves, o certainly no longer with the view of settling them in their native seats; for they already had fixed seats like the other peoples. It merely concerned them to dominate all others from their own country, just as the Romans had done. The greatest monarch of the Franks, to whom history has given the name of the Great, would restore their empire, when he subjugated the allied races of Germany and of Italy. United with the Church, his empire should become an empire of peace.

But in spite of the rule of Christianity the generally desired peace on earth, the universal peace could not be established. The independent feeling of some, the dominance of others, or also the reliance on the power of the sword, the mistrust of one in the readiness of all others for peace were t too great, for peace to be general and permanent, that each one saw was ensured only so far, as he could trust to his sword. The unity of the empire of Charlemagne could not be maintained in opposition to the desire of each of his heirs to r rule for himself, so far as the point of his sword reached. But there also existed certain peoples, not contented with t their dwelling places, ready to fight anew and threatening t the permanently settled peoples. Normans, Slavs and Hungarians stood ready to throw themselves upon the peaceful European nations, great danger impending over them on another side.

Nearly at the same place at which the religion of the Cross was given to the nations, a new religion arose 600 years later,

that of Islam, and if the cross had extended its shade peacefully over the warlike world, Mohammed's adherents struggled to spread their faith by fire and sword, and to ensure to it in such manner the rule of the world. They had soon subjugated western Asia and civilized Africa, sought to penetrate from Spain into Europe, and threatened from the West the eastern Christian communities, as they were threatened from the E East by the Byzantine empire. Meantime also Islam, like Christianity, had carried germs in itself or had found such among the peoples, that it first made its own, and to whimh therefore fell the rule in its empire, that became the foundation for the development of an individual civilization and likewise of an elevated art. They certainly required time for their d development, and at first only the warlike rule of Islam made itself felt, and brought to the West the need of keeping its swords sharp.

The Church zealously endeavored to maintain the world at p peace; it developed the ideal of a world empire, that with t the emperor at the head, should include all nations belonging to it in its peace, should form the empire of God as the empire of the Church, an entity mighty by the power of the emperor, from whom all others held their own in fief, elevated to civilization by the influence of the Church, that was the spirit of this body, led by it, which ennobled each individual. All would lead to eternal blessedness. The conception was and remained an ideal, that was never attained, since cares and misfortunes led mankind from the way, by which alone it was to be reached. The world was and remained an empire of war.

To give this Christian importance, thereby to idealize it, was the only thing to which the Church on earth could attain. The warrior bac.me a knight, whose highest aim was the combat with unbelievers, against Islam. To take away from it the places in which the Savior had lived and worked, to erect a new Christian kingdom there, was the highest problem of the knight. Thus a part of the best strength of the West passed into the East to seek battle there. A close contact of Christians and mohammedans occurred, and just this period of contact, this time of combat is it, in which both civilizations were apparently independent of each other, and yet were influenced by rivalry in a higher sense, developed entirely different

from each other in their characteristic peculiarities.

In the preceding half volume is laid down the consideration of Mohammedan art. There are characterized its elements, the elements being given from which it developed. It is shown just how in the 12 th century was formed the individuality, how in the 13 th century the art became complete with the finest characteristics. We now have to show, how the procedure in t the West was entirely contemporary, how also with us in the 13 th century a poetic fragrance beautified all works of art, called forth a flowering of these with us, which does not yield in charm to the works of the East. Just as with the 14 th century the art of Islam no more increased its innate importance, as it still won in charm, but limited itself to a formal play of lines, so likewise with us. If with the 15 th century the art of Islam became fixed, and without creating anything more properly new, it lived for centuries on what had been produced, then with us the course was entirely different. In the East the entire culture was in the service of a s single idea, followed the single direction, from which a derivation was indeed not conceivable. In the West new ideas, n new spiritual currents of culture could give other directions, and as the knightly period began to diminish in spiritual importance, the spirit of the citizens commenced to win that influence, which made it possible for it to indicate the direction of the time. Thus it was made possible for us, that the 15 th centurydesignated a new epoch. Indeed in formal respects it was at first dependent on what the 13 th century had created, that we regard as the best period of mediaeval art, and the forms of the 15 th have lost something of the earnest dignity, which dominated in the 13 th century, so that with a c certain right we may designate the 15 th century as a time of decline. But if we look correctly, then acts something entorely different again from before; there appear so many new elements; what in a weaker way was brought from the earlier time and was continued, is so secondary and purely external, that still then the time may be regarded not merely as one of decline of the older art, but appears as one entirely new, that had not suddenly broken with the older tradition. But again about the change from the 15 th to the 16 th centuries we see art assume new forms; meantime however apparently different

are the external forms, yet their nature and spirit are scarcely different, but only a little further developed than during the entire 15 th century, and the introduction of new external forms is nothing more than a new proof, that in contrast to the Mohammedan, Christian-Western civilization was able to adopt new ideas and to give them form.

But one thing continued through the entire middle ages. Just as little as the knightly, the citizen period following it w was a time of peace; also its development completed itself a under the rule of the same elements, that in the preceding e periods had opposed the ideal. The tendency toward independence of the individual, who would not join himself to a great entirety, and the rule of the same, who made yet others subject, and would restrict their interests, pressed weapons into the hands of every one. Tumults of war filled the world at a all times of the middle ages, and if it was not the great war of people against people, it was the little war of man against man, of princes and nobles against their equals and against the cities, that raged everywhere.

Whoever was not equipped for war and strong enough to defend himself against everyone, who might come, was lost. To serve the ideal, to rise by it, to beautify his life by its culture, could only do so, who was strong and powerful enough to defend his ideal and also his existence. Nothing and no one had a higher importance, than was given him by the strength of his arm. Even the dignity of the emperor gave him no other importance, than any other had, unless the greatness of his power placed him condition to give his dignity weight. E Everything rested on the point of the sword; only under the protection of the sword could any civilization develop, only under its protection could art flourish. Great undertakings of whatever kind, however important for the progress of civilization, could only flourish under the protection of a great power, and the more the subdivision, the smaller the power of the individual, and so much smaller must the undertakings be; but so much the greater their number and more varied their k kind. Since the architectural works were thus dependent primarily on the conditions of power of those building, structures are also the first, that must form the foundation of all civilization undertaken, and so is also most faithfully reflected

in the buildimgs the external course of the history of the m middle ages.

A. MILITARY ARCHITECTURE.

Chapter 1. General.

1. Political Organization; Mode of Life.

The security that every city must afford, at which civilization should exist, is based on the least possibility of conquest, thus on incessibility for a hostile army and difficulty of attack, on the other hand being easy repulse of such a and convenient defense in general. What is true for the individual city, also comes in consideration for broad regions and entire countries. What nature offered for safety must be carefully utilized or replaced by art. The monarch's care availed primarily against any invading foreign enemy, or against a discontented and rebellious people, such as unruly and defiant vassals. The power of the ruler rested on his army, its assemblage on that each individual was bound by his interest to keep faith, that he had sworn to him. Only by the entirety of the men could the population of the country be held down, of whose revenue the monarch assigned to each so much as corresponded to his rank. Thus already in the Carlovingian period was formed feudalism, the only means for combining all elements, so far as arms could lead to the condition, to protect and support all by unity, when each one had definite duties assigned to him, with this toward higher persons, and for all finally toward the king, whereto appeared as ideal yet t the connection of the kings with the emperor, and in conception their subordination under him. The duties of the individuals were great; therefore to each one was given a power and a corresponding possession as a fief. The dieal was thought the empire given in great fiefs by the emperor to the kings, these being his vassals. Accordingly the king divided his realm into great fiefs, that he gave to the great vassals, to dukes and counts in Germany; these divided them again into s such for the middle tenants, the latter theirs into those for the individual man, each of which had his duty for this to a accompany his superior with a corresponding party, and go with him to render to the king military service, to put in condition of defense the land assigned to him, and to remain thereon, to defend and protect it in case of attack until further help came, to rule the land properly in peace, to govery and care in the name of his superior in war and peace, to keep

true faith for himself and all his men in war and peace. This ideal arrangement, whose actual condition historians certainly can clearly show at no time and in no country, but which rested on the finest of all virtues, the fine unchangeable t truth, corresponded as far as possible to the external preparations for the defense of the land.

2. Defense of the Country.

All countries were strewn with a network of cities and castles after a well devised plan; strong places from which the invading enemy could be fought, each one of which must be taken, before the enemy could penetrate farther, but each of w which must at least hold out until a strong resistance was o organized behind it. Each of these strong places was the seat of a nobleman, who with the help of his vassals had to build, maintain and defend it, wherefore the land and subjects assigned to him were sufficiently extensive, that its revenues m made it possible for him to fulfil the duty. He did not receive the land as his property; but as a fief, that he had to rule as an official, belonged to him the land, city or castle. While the castle had to be kept closed against all others, it stood open to the feudal superior and his officers, and finally to the emperor, in whose name all was ruled and done, that there might everywhere be security and protection, from every point the safety of all must be cared for. So should it be at least; but self interest and desire to rule, insubordination and faithlessness often enough made something entirely different in the fine arrangements.

Meanwhile indeed the security of the land was not the final purpose; it should only give the possibility of a successful development. A country not capable of this had no value; to conquer it, to possess and defend it had no sense; only if it fed its occupants, or if it served as a gateway, as a connection between two valuable countries, had it value of itself. Only a profitable and good land did an enemy seek to make his own; only such therefore required defense and protection. Therefore security in case of war was not the sole problem of t the organization; rather the requirements of peace stood in the first place; what was done for war must restrict these as little as possible. It must be possible to the countryman to cultivate the fields; there must be developed places where

the industries blossomed; there must be possible a corresponding peaceful traffic near and far, whose course could indeed be closed at any moment, even if there were no doubt of the peaceful purpose, but which indeed formed the aim of the road. The greater the traffic, so much more valuable was the country, but also better founded was the fear, that on his own account an enemy would menace the land. The greater the capacity for revenue, so much more necessary was the most extreme care in the arrangement of the defensive measures.

Therefore when in the 10 th century the justified fear of new invasions placed before the eyes of all settlers the necessity of the strictest subordination among themselves, which by the unity of all would alone be strong enough to protect all, developed this system of the organization of strong places, which now fills with amazement, and for Germany it is king Henry I, at whom we wonder as the founder of cities and castles. While in the seats of ancient civilization in Italy and France it mostly sufficed to erect the fortifications of those cities, that already the Romans had selected in similar respects, there must be created new fortresses in Germany in the measure, in which in place of pathless forests the land was open for the plow, and the population necessary for this was distributed over the land.

3. Farm Courts and Villages.

Everywhere that a piece of arable land had been wrested from the forest (even today the villages there originated frequently bear the names "Reuth and Rode' (clearing)), was a village necessary. The magnitude of the village district, or where the peasants occupied separate farm courts, whose boundaries were self-determined, so that the countryman did not have to go too far from his dwelling to the outer fields, that thereby the time he must spend on the way should not be out of proportion to the time, that he could devote to the preparation of the ground, and therefore the outer fields should not lie too far outside the range of his vision. Thus it depended on the number of countrymen who formed a village. Therefore also, where single farm courts did not form the rule, the number of peasants in a village seldom exceeded a certain limit; 50 to 60 of these with their families already composed a public village. So far as forests of considerable extent between

the village domains in the public interest, the villages adjoined each other as closely as possible. In the midst of a n number of villages were to be founded cities, in which citizens and merchants could dwell in order to satisfy the needs of the vicinity. The roads must lead through the country from city to city; even the villages and separate farm courts must be accessible and be connected with the nearest city; traffic also now established its requirements. As conditions existed toward the close of the first thousand years, there were rough precipices or lofty mountains, passable with difficulty and perhaps only at certain seasons, placed outside the traffic as impassible. But also on flat hills and in the plains were extensive forests, through which no road passed, in the latter further being heaths, morasses and unsafe ground, obstacles to traffic. To avoid these was the problem of the traffic organization. First of all the traffic roads must be made secure; on them must be arranged villages at definite distances for the traffic in peace, in which the wanderer found food and shelter, in which he could obtain the aid of an artisan for himself and his horses and wagon, or if he went by water, for his vessel. These villages must be secured by defensive measures.

4. Serfs and Free Citizens; Cities.

The rural population, so far as they cultivated the ground, were not its masters. They were serfs,[1] belonging to and bound to the soil. They could not bear weapons and should not. Thus they were under the protection but also under the orders of the warriors, who protected country and people, holding under them if they desired to rent anything. Every place and every village had its master, and in the village was at least a strong house in which its magistrate dwelt. Even the cities had their lords. But their population at least for a great p part could bear arms, and even if not so from the beginning, soon became free. Not merely the purpose to afford opportunity for the adjacent rural population and those traveling the roads to have artisans and merchants in the vicinity, but also the necessity for protection of the country at certain localities, where the safety of the roads required it, to have a larger garrison, was it that determined the arrangement of cities. Likewise their magnitude was neither accidental nor

capricious. The conditions of traffic on the one hand decided the number of peaceful inhabitants; from the importance of t the location resulted the number of the necessary defenders. Both were in intimate relations. According to the number of defenders was made the length of the wall drawn around a city. The population carrying on traffic and industry provided the defenders. They must therefore be organized in a correspondi-ng manner; on the one hand by the judgment of the needs was determined the number required from each trade and to be fed by it; on the other hand the members of one or more trades were combined in corporate guilds, to each such body being assigned a definite duty in case of war. Corresponding to the feudal system, it was therefore first guaranteed for the certainty of the subsistence of the different members, that the acceptance of new members in the corporation was only promised, and only occurred to proved the necessary number of citizens able to bear arms, to satisfy the military requirements, assigned to each guild.

Note 1. p. 7. The conception of "free" and "serf" is certainly not in the modern sense, but is understood to be limited; dukes and counts were also the king's vassals, thus not being absolutely free. But also the latter did not stand before his master without any rights.

The origin of the "guilds" was one purely military. From t the war officials, the service men in the country and at the princely seats, so many of which were embodied, developed the country nobility in the course of time, from the city soldiers came the citizen class, whose best placed elements formed the "families", i.e., the city nobles (patricians), while that part of the city population, to which the defense was not directly assigned, as later settlers likewise lived in a sort of serfdom. Many peculiarities in the appearance of the old cities are explained only on this ground of the conditions.

5. Castles.

Similarly to the magnitude and the warlike importance of t the cities, is that of the castles grounded on their part in the general defense of the country. A certain city required security, without which the traffice made a city necessary t there, or that the location made its founding possible; thus men were satisfied by founding a castle, which merely received

so much of a garrison, that it only created in itself even t the most essential in the needs of the life of the citizens, but otherwise in regard to their needs calls were made both on the rural population and on the nearest city. Each city had, like its lord, also its castle. Occasionally a city was added gradually to a castle, where the location permitted this. We can clearly follow this in most cases, and it will be mentioned later, when we consider city plans more fully.

6. Basis of Organization; Relaxation of this.

In general the entire basis of this organization extends b back into the 10 th century in political, as in relation to fortifications for Germany, at which time indeed many older elements already existed, that could be utilized. The further development was completed from then until the 13 th century under the influence of continually increased desire of independence, and therewith a constant loosening of the homogeneity of all in a great entirety, as well as the combination of all for a common purpose. The dukes, instead of being the king's officers, strengthened their power and possessions, made their fiefs heritable, and already in the 12 th century appered as independent princes, who did not "give to the emperor what belonged to him", but only what seemed good to them, and the power of the emperor and of the king could not be strong enough, that he was actually their master. Likewise the counts sought to make their offices and also their fiefs heritable; they had withdrawn themselves from the influence of the dukes, so far as they were subject to it. It made no difference, that certain of the great imperial domains were in the hands of bishops; their domains became just as independent as those of the secular dukes. For the most part they were also merely secular nobles, occasionally first after selection as bishops secular persons formally included in the Church by quickly completed ordination as priests, who afterwards as before rode horseback, and had more interest in war and b battle, than in the cure of souls of the flock entrusted to them with the crozier. Just as little difference did it also make, that monasteries and foundations acquired secular power like the counts. They, i.e., their priors were now also small princes and had even withdrawn themselves from the ducal power, and had secured their secular possessions as well as the

counts. Beside the dynasties also appeared the smaller nobility, composed of the soldiers, that were placed in the castles by the king, dukes and counts, to defend them and to rule the surrounding domain, by their tendency toward independence, and they also succeeded later in making the castles into seats free from the power of the princes; the endeavor for this existed quite early. More fortunately a number of cities knew how to make themselves free from princely authority, partly like the other powers by open combat against their superiors, partly by money at their disposal, as alone acquiring such in the realm, and by means of which they purchased one right after another from their princes, as well as their governors a and also the kings; all insubordinate vassals wished to receive it to extend their power as opposed to superiors, needed money continually in order to bind faithful servitors to them and to hire mercenaries.

7. Dissolution of the same.

Thus with the first half of the 13 th century all conditions were changed. The Roman imperial dignity was extinguished; since as it had developed, it was an emanation of the ecclesiastical power and without any real force, only capable of e existence in the closest connection with the Church, while i its wearers weakened themselves more and more in fruitless c contests with the Popes, since they were indeed "Roman emperors", yet not as they would be, such as the ideal of the time saw the emberor as holder of the secular power and so expressly designated him, not what alone the kings determined, to r regard the emperor as standing above them, the "moon", whose splendor is a reflection from the "sun", as which the holders of ecclesiastical authority considered the same ideal, and w who had the power to bind and to loose for this and the other world.

In Germany with the imperial dignity, borne by German kings, the royal power also vanished. About the middle of the 13 th century also Germany had kings no longer. All Europe consisted of a series of small and partly of the smallest independent states, whose masters occasionally bore the name of king indeed, but of which only those having the names of France a and England had any importance, not those states in their present sense, but only a portion of them, since they had actual

power.

While then here and there from the 13 th century onward the royal power again became stronger, the kingdoms gradually enlarged, one indeed could not find a king again in Germany toward the close of the 13 th century. The government agreements scarcely allowed him more, than the office of judge in the contests over the possessions and powers of the great and little pinces and cities, and while the first new German king w was again chosen and established peace and order, he could a actually have no purpose, other than to confirm one usurped right after an another, the great persons as little as might be, the harmless inferiors rather more; for the king actually remained scarcely anything more, than what he already possessed as a prince. For if he could still allow himself to be crowned as a Roman emperor of no importance, that he sometimes was an umpire, that he conferred a title and exceptionally a reverted fief, i.e., an estate left without a master by the conditions, did not substantially increase the power that he otherwise held as prince.

3. Development of Cities in the 14 th and 15 th Centuries.

Important was primarily the arrangement of the conditions, that they left to the cities the right of knowing themselves independent. Certainly these were obtained in contests with the princes. The right of subjects of the king to fight in h honorable combat could not be lessened. But the advantage was evermore on their side, for they alone had the money. The number of these cities, that won their freedom increased, and s since with the 14 th century the invention of gunpowder and the introduction of muskets changed the entire nature of war, and because entirely new modes of fortification must be created, still only the cities, as they had the money, could derive full benefit from the new conditions, but princes and nobles only so far as cities remained to them, that brought them money. On architecture and first on military architecture these circumstances had powerful influence, and it is not superfluous for us to speak fully of it here. We shall see how in spite of the attempts to adapt them to the new conditions, the castles like knighthoood gradually lost their importance, how such only remained to the cities, and as the latter employed all means to be best equipped for attack and defense,

so that at the close of the epoch now occupying us, then at the end of the 15 th century the castles could be destroyed, which had lost their importance for the defense of the country, and were yet seats of a poor nobility without influence, that prolonged their existence by extortion and robbery.

Thus was laid the foundation of a new period of time, in w which a new condition of equilibrium of the different factors of human soliety was formed, in which other problems were to be proposed to architecture. Now the princes transferred themselves into the cities, and erected palaces instead of castles. But the free cities gradually lost their importance again in their favor, on which the princes employed the means of an entire country; the necessity for a closer combination of all elements in the formation of great states occurred evermore. To describe this time in its architectural creations becomes the probelm of the author of this Section of the following V Volume of this “Handbook”.

Chapter 2. Defense of the Country and the Traffic.

9. Course of the Roads; River Valleys.

If we appreciate the military architecture of the middle ages and desire to recognize the grounds compelling it to p pursue the course it actually took, we must first consider the external conditions under which at the beginning of our period, thus about in the 10 th century, traffic throughout the countries generally was possible.

We have before shown that morasses and swamps, wild heaths, widely extended forests, steep hills, abrupt rocky precipices obstructed traffic, and must be avoided. The construction of a regular road, such as the Romans knew, aided the traffic in very slight measure. Likewise the building of bridges caused many difficulties, so that the passage over great rivers did not occur everywhere, and the construction of bridges itself appeared as a religious work pleasing to God, by which man b benefited his fellowman. Traffic therefore primarily fassed along the river valleys. Gently rising banks in wide valleys even with bad roads made traffic easily possible along the shores, and if these were impassible for a distance, a vessel on the water was required. By a slow ascent the traveler came thus from the seashore to the mountains, where over a pass on the watershed he came into another river valley, that again brought him down to another seashore. If the road had to pass over a river, without the immediate erection of a bridge, then men chose a shallow place, a ford at which passage was easily possible. But also the construction of a bridge was the easier, the less the depth of water where it should be built. Such a ford was a point naturally given, that was occupied in the interest of traffic. Many cities therefore bear in their names the appelation of ford (furt). Other places on the river, whose occupation in the interest of traffic was easily i intelligible, were those at which a branch discharged into a main river, where also naturally one route branched from another, and the side river likewise led over the watershed into another river valley. If the river led from the valley up into the mountains, the valley became narrower, the population was small, and so were side valleys everywhere, whose occupation men had found worth the trouble, since they still had s spots for cultivation and at least for grazing. The occupants

of these smaller valleys descended into the larger ones, and by these came into the world traffic. From the larger ones the peddler carried his wares on the backs of pack animals, at last the peddler's back taking them into the most distant mountain valleys.

10. Mountain Passes.

The passing of a mountain chain, that either exhibited inhospitable rocks or was covered by a dense forest, that shut in the view, so that the wanderer ran a danger of straying, must pass as a part of the way, that could only be undertaken by certain bold men entirely acquainted with the region. The passage over the mountains was thus limited to certain entirely suitable places. To garrison these was also in the interest of the traffic. This determined by its extent what and how many intermediate points must exist for its benefit, in order to satisfy the requirements of travelers in addition to those of the settled population, thus where from villages were to be developed cities.

11. Military Garrisons.

All these points must have military garrisons, and indeed the amount of the warlike expenditure was arranged according to the importance of the place, both for the possible closing of the road, and for providing a warlike power against an invading hostile army, that overran the country. In the high m mountains, where nature itself does all this, were not needed such extensive arrangements as down in the valley. Where above at the pass were scarcely found people, who might settle there in peace, who there sought and found their living by satisfying the needs of others, the assemblage was not great, and where on a high mountain pass only some pious monks might settle, to devote themselves to the service of travelers for the love of God, there the problem of the military architect was no extensive one. An enemy was scarcely to be feared there, since an army with all its equipment could not penetrate there, where scarcely a single man traveled.

It was otherwise in the broad and low river valleys, where not merely on the shores but also on the water, not only the multitude of peaceful wanderers traveled, but even an army c could easily pass forward, the more easily and closely, the wider the extent of the valley. The defense of this could th-

therefore not occur by a mere obstruction. There must also a greater army exist there, where such a one could penetrate a and extend itself. According to the location must exist castles and fortified cities. A main traffic route therefore showed city by city and castle by castle.

Whoever glances on a map, and carefully examines how for e each separate strong point there is a larger or smaller region, that it can dominate, how conversely for the security of every region according to its nature, is necessary the military garrisoning of a number of definite points, will be astonished by the practical views with which the network of strong points is arranged, how the mutual positions are chosen, how connection is established between them, how the strength of each one is given with regard to the whole, so that the highest effect possible may be produced.

12. Example of a main Traffic Route; lower Valley of the Rhine.

If in order to show on a single example, how one of the European main traffic routes could be chosen, to connect this with our consideration, we could scarcely find a more suitable example than that of the Rhine, which flows through the m most favored region of Germany, and that from the earliest t times formed one of the favorite connections between southern countries with highly developed civilization and the North.

For this consideration, we beg our readees to take in hand one of the well known "Rhine panoramas."

Antique civilization had already found necessary the strong occupation of a series of points by great garrisons, thereby laying foundations for the most important cities, that were all occupied again in the middle ages, and were newly fortified. To these was added a series of castles, that rose on the tops of the hills. From the Netherlands, where the North sea penetrated in several arms, onward to Cologne and Bonn are v vast plains, through which flows the Rhine in many curves, plains that to the shores of the deep sea were densely populated from ancient times, and had attained a high civilization. A series of cities, at whose head Rotterdam and Dordrecht were mighty bulwarks, were erected in the regions of the lower Rhine, to which were allied those scattered along the entire seacoast from Dunkirk to Emden, that dominated all landing

places in the great Netherlandish plain, in which also lie t the mouths of the Rhine. Yet the waters, from which men wrong the arable land, formed the material means serving for defense, when withdrawing to the low hills, the land was so far f flooded as to be inaccessible, unless navigation was possible over the flooded region. As the proper key to the Rhine we m may regard Nymwegen, located on a low rise on the bank of the Rhine, which was connected with Breda, Herzogenbush, Arnheim, etc., from which the route passed to the Rhine. Still the Rhine province could be reached in other ways; but the best was always the river itself and its shore, that was dominated by the cities of Cleves, Emmerich, Rees, Xanten, Wesel and Duisburg, aside from other intermediate smaller ones, as far as Düsseldorf and Neuss, to which farther above was added the mighty fortress of Cologne, while more distant from the banks on both sides a series of cities protected the different roads, that led to Cologne and the Rhine valley commencing a little above. Cologne was a mighty fortified camp, whose citizens alone represented an important garrison, and to which those of the entire vicinity could be drawn, so that it was not merely possible, supported by that camp, to oppose a mighty army to the enemy in the valley, but it also stood there so commanding, that without besieging and taking Cologne, and w with the army therein enclosed in his rear, could proceed farther against the Rhine valley, at whose proper entrance was also built a fortress, the city of Bonn opposite the mouth of the Sieg, before the valley became narrower.

Beyond Bonn the hills bore castles, which dominated the flat shores of the Rhine to Rolandseck. On the bank of the Rhine lay the little fortified cities of Mehlen and Oberwinter, Rolandseck opposite the mighty Drachenfels, with the little cities of Königswinter and Honnef, while the islands of Nonnenwerth and Grafenwerth in the middle of the Rhine afforded points of support, that all combined so that the enemy must first overpower all, until he could ascend the valley farther. Up to Remagen indeed then the left bank of the Rhine was impassible, the traffic being turned to the right bank, so far as not carried on by water, where the small cities of Unkel and Erpel limited the flat land lying before the hills, but the months of two side valleys were closed by Kasbach and Linz,

between which lay the castle of Ockenfels on the hill. Where opposite Linz the Ahr breaks forth from the mountains, it had flooded a small plain and compelled the Rhine to withdraw to the other side close to the foot of the hill. From Linz to H Hönnigen therefore the right bank afforded no route. The castle of Dattenburg had served to strengthen Linz, while Argenfels dominated Hönnigen. The connecting route extended through the hills near Leubsdorf, Argendorf and other villages, c connected Linz with Hönnigen, and indeed could aid the defense; but a hostile army could scarcely consider going around the bank of the Rhine in this way; it must move directly forward through the plain, which the Ahr had flooded on the left bank, at the lower end of which lay Remagen with Nieder-Breisig at the upper, while on the right bank of the Ahr, Sinzig rose at the foot of the hill, so that this entire plain lay in the power of these three cities, of which Nieder-Breisig was further protected by castle Rheineck. A narrow road remained at the foot of the hill on the left bank upwards through Nippes, Fornich and Namedy to Andernach, while on the right bank of the Rhine a similar one on the broad plain led upward to Rheinbrohl, where the mountain again interrupted the road and again projected close to the river, that was dominated by castle Hammerstein and the villages of Nieder- and Ober-Hammerstein lying at its base, from which the road passed up the Rhine by Landsdorf, Fahr and Irlich to the mouth of the Wied river. Andernach had to protect again a considerable plain on the left bank of the Rhine.

Relatively little fortified now appeared a considerable extent on both banks; for neither Neuwied on the right nor Weissenthurm on the left extends back into the early period. We have Engers on the right bank, opposite on the left being Urmitz, Kalten-Engers and Sebastian-Engers, little villages scarcely important enough to protect sufficiently the wide bank, then to the mouth of the Moselle were also Kesselheim and Wallenheim, so to Coblenz on the right side of the Moselle, that also had a bridge-head on the left side of the Moselle, fell the problem of protecting the broad shore to Andernach. On t the right bank, where the hilss of Engers came close together, there lay at a small distance castle Sayn, and still farther up the Rhine were Bendorf and Vallendar. Doubtless a fortress

also stood on the island of Niederwerth. Opposite Coblenz was the mighty chief fortress of Ehrenbreitstein. At the foot of the hill that bore this fortress, the way led along the Rhine beyond Pfaffendorf, Horchheim and Nider-Lahnstein to the Lahn discharging there, on whose left bank was enthroned the fortress of Lenneck on a lofty rock; at its foot on the Rhine being OberLahnstein. On the left bank above Coblenz, which dominated the plain to Andernach, also the access to the Moselle valley and the important connection of Treves with the Rhine, the hills again approached the river, that centuries before indeed had a wider bed than today, so that no road but at most a border path led a piece beyond castle Stolzenfels, until it reached the again wider river. On the right side the valley also became narrower; at the foot of castle Marx the little city of Braubach also found room. For also here the hill came close to the river. Then two great projecting hills, one extending from each bank, forced the Rhine into a great curve, so that it must flow backward a good piece, until by a second curve it could again pursue its former direction. Since then at certain places the flat shore was washed in, on these some little cities found place; lowest and opposite Braubach is R Rhense, then still on the left bank are Niederspay and Oberspay, on the right bank being Osterspay and Filsen, the latter occupying the apex of the projecting hill and being dominated by castle Liebeneck, opposite the important city of Boppard. A further distance upwards to about Bingen and Rüdesheim, the rocky precipices of the hills rise directly from the water of the Rhine, which they cause to make considerable curves, into whose depths so much shore has been washed, that small cities found room everywhere. Thus appears on the right bank the little city of Camp, above this being castles Sternberg and Liebenstein, then on the left bank are Salzig and Hirzenach, on the right Kestert and Wellmich, the latter dominated by castle Thurnberg.(The Mouse). Then on the left bank appears castle Rheinfels, below it being the small city of S. Goar, opposite it is S. Goarshausen, above on the hill is castle Katzenellenbogen (the Cat). Left then stands again along the bank Oberwesel, above it Niederburg and castle Schönburg, then Bacharach and the fortress of Stahleck. Opposite and between t the two little cities last named lies Caub with castle Guten-

Gutenfels and the fortified palace in the midst of the Rhine. Farther up rise on the right bank only the little cities of Lorchhausen and Lorch, between them castle Nollingen, while the left bank above Bacharach shows castle Fürstenberg, castle Heimburg, the little city of Nieder-Heimburg, castle Sonneck, the small city of Trechtlingshausen, then castles Falkenberg and Rheinstein, when directly before Bingen, by the flowing in of the Nahe, the valley of the Nahe branches off from the Rhene valley. Before the mouth of the Nahe lies the Mouse Tower on an island; on the projecting hill opposite the mouth of the Nahe are placed above castle Rossel, below on the Rhine being the little city of Assmannshausen. The entire series of these fortified points are unimportant in detail; on their combination and on the possibility of acting together is based their power. Therefore it can scarcely be doubted, that a all of them extend back into the early time. It does not seem thus with castle Ehrenfels located on the hill slope of the right bank, that must have been added rather late as an extension of the not very strong walls on the same place.

From Bingen onward, above which city is enthroned fortress Klopp, the left bank widens again, while also the hills recede somewhat on the right bank. Thus on the left on a considerable plane are located the cities of Kempten, then Frei-Weinheim, Heidesheim, Budenheim, Mombach, behind which rises an isolated chain of hills. Yet this series of hills is easy to go around, the road behind therefore being again secured by the little cities of Ober- and Nieder-Ingelheim, about half way between Bingen and Mentz, that must likewise be fortified by forts, since old Mentz was limited to the plain. The right bank shows little cities and those at quite small distances apart, first Rüdesheim, then Geisenheim, Winkel, Oestrich, M mittelheim, Hattenheim, Eltville, Niederwalluf, Schierstein, Biberich (wosbach), then Castell opposite Mentz, and Kostheim already on the bank of the Main. Behind these cities the hills extend back from the water, their heights partly fortified by castles, so far as they still dominate the Rhine route. Behind is the Johannisberg, behind Winkel is the house Mumm, behind Mittelheim and Oestrich is castle Vollrath, behind Eltville, castle Scharfenstein, and at its base is the little city of Kiderich. What now succeeds even belongs to the safety of

the valley of the Main, and when the Main had sufficient water to make it certainly navigable, offered one of the most important connecting routes to the East, in spite of the many curvatures.

If we so far have only considered the small cities and castles, then in nowise was the entire remainder of the land left defenseless. We have indicated just those strong points, that directly dominated the road. An enemy desiring to penetrate into the country, would only have needed to leave the r route and march across the plains from village to village, unless obstructions were there opposed to him. But we do not have in any wise to regard the villages as so entirely open. Aside from that in each stood a fortified house of the possessor or of his officer, the boundaries and the separate courts were enclosed by hedges, walls, ditches, etc., that were partly right strong and opposed such obstructions to the invaders, that an advance was only possible at the places, that were even designated for traffic. At the time when monumental fortifications in stone formed the exception, that many a master made here his strong house as good and well fortified, a and even the dwellings and fields of his peasants, as those lying on the street to secure their city. The honored reader may still reflect further, how in addition to the still existing villages, how by obstacles of all kinds in addition to what nature had done by river, brook, hills, swamps, wet heaths, etc., the plains were indeed made impassible, so that o only those acquainted with the locality could find those open places on which neighbors traveled.

To a sort of barricading must be give attention, since vestiges still remain. This is the so-called "barriers", trees interlade and trimmed like our modern living hedges, forming impenetrable hedges of considerable strength, that for long distances made a region inaccessible. Even if it were not impossible to make a way by cutting, this held back an enemy f for at least much time, and where such obstructions were presented successively, where those knowing the locality regarded themselves able to irritate, to entice to places at which with less strength a vanguard or some advanced soldiers could be overpowered, or at least the march of an enemy could be so delayed, that their own soldiers could be gradually withdrawn,

and it was possible, and that help could be drawn from a considerable distance and an army be organized, before the enemy had made particular progress. But therefore the devastation of the country was of equal importance with the removal of t the obstructions, and it is nowise a mere mark of ferocity, but a necessity required by the conditions, that led to the fact, that devastation played so great a part in the conduct of the wars of the middle ages, since even the enemy could o only advance by "singeing and burning".

As the particular importance of the Rhine route began at C Cologne, so that this city as an advanced post formed a strong camp for a greater garrison, that was in condition to protect the plain to Bonn before the entrance into the Rhine valley, then at the lower end of the valley of the Rhine opposite Bingen, Mentz had a similar problem; for already from Bingen the valley ever widened, and from Mentz up to the place at which the Neckar by its junction with the Rhine makes this a great river, but which passes through the country in great curves, the plain of the Rhine is a broad region subject to floods, along the sides extending two independent roads, therefore at a considerable distance from each other, the defense of each of which was separately provided, and that only near Oggersheim and Mannheim again approached so nearly, that after the road through the Neckar valley branched off, and obtained independent importance from Heidelberg, a combination was to be considered. Meanwhile the right bank of the Rhine vallen is so broad, that no necessity existed there to carry the traffic route close to the Rhine. To it approached the hill road, that from Frankfort led by Heidelberg into the great plain of the shore of the Rhine. Thus the ground receded on the right bank, and the problem of defending the line of the Rhine was referred exclusively to the left bank. Then we also find there above mentz and adjoining the heights of that city, where the hills approach the Rhine is also a series of smaller cities, the most important of which is Oppenheim, after which the hills again recede, partly directly on the Rhine, partly in the plain behind it to Worms, then farther upward are Spires, Lauterburg, Strasburg still farther above a and finally Basle. The plain behind these cities as far as t the Haardt and the Vosges has its own network of fortresses.

Consideration of the right bank above Mentz indeed shows us also certain strong points there, of which the most important may be Stockheim, Gemsheim and Lampertheim, while the proper traffic route from Frankfort through Darmstadt, Bensheim, Heppenheim, led to Weinheim near Heidelberg on the Neckar, b between which city and Mannheim and located in the middle, L Ladenburg again defended the passage over the Neckar. The farther course through the Rhine plain upwards now passed at the feet of the hillr, and in its measures for defense no longer bears the character of protection of a river valley, but rather that of a great plain extending at the feet of the hills. First from Basle, where the Rhine comes from the East at a r right angle, again occurs a proper defense of the river valley as far as Lake Constance. But the traffic through this part of the Rhine valley formed the continuation of the traffic route of the left bank of the Rhine, aside from other travel routes, while the continuation of the traffic route at the f feet of the hills on the right side of the Rhine extended from Freiburg across the Black Forest to Lake Constance.

Switzerland with its giant mountains formed a powerful obstruction to traffic, and to traverse its Alpine passes was a great undertaking for the merchant, who desired in peace to exchange the products of the North and the South. But still a far greater undertaking was that so often imposed on the German kings to march over the Alps to Italy, and if an invasion failed, to fight through homeward again, and justly the ancient traditions therefore already refer to the many footsteps marching toward Italy and the few returning soldiers.

We have given the measures for defense of the Rhine valley as an example, how a river valley was secured. The defense of the Alps would be a second example, that we could study with the reader; as a third might be regarded one of the routes, that led from the Alps through upper Italy into the valley of the Po; but aside from the fact, that we always find the same ground principles, the small space assigned to the author forbids considering more than one example. Therefore we turn to the examination of the details, and we see how military architecture realized its problem therein, and how it was developed.

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Chapter 3. Plans of Castles and Cities in their contemporary Conditions.

13. Earlier Fortifications.

On many details in the military architecture of the time, when the great network of fortresses was erected for the defense of the country, we are little instructed, since later n nearly all castles and city fortifications were rebuilt. There are two traditions connected therewith, that of the Roman, and that of the ancient German military architecture. We must first remark here, that a great number of remains of the older fortifications in Germany are attributed by the people and the older writers to Roman origin, but almost without exception, they have nothing to do with the Romans, but are even mediaeval, and that what of Roman military architecture actually remains among us, mostly consists of relatively few ruins, so that we must be quite fortunate, if we still have a few ruins of masonry above ground, and with great labor establish this or that detail. For the greatest part these still remaining Roman structures are the ruins of such works, that were out of use in the middle ages: for where a fortress of the Roman period must serve further, then must it be suited to the new conditions. It was rebuilt again and again, so that nothing of the old even remained. While the Roman castle (castrum) served exclusively for military purposes, and the peaceful p population with its dwellings and villas, temples, baths and even theatres were grouped outside it, the mediaeval city gathered the entire peaceful people within its walls. Now Rome itself indeed and many other great Roman cities in the antique period were surrounded by massive walls. Yet in Germany this does not appear to have come, and thus we have particularly few remains of Roman city walls in the ancient cities erected on a Roman foundation, since even the Roman castle w was too small for a mediaeval city. But still less are the f facts rightly given by those authors, who desire to see in o our castles, particularly in their nucleus, Roman towers or other Roman remains. [2] It may be stated with tolerable certainty, that the Romans in Germany adhered the most possible to the plains, went sometimes to broad topped hills, but never laid out fortresses on steep hills and high rocks, to which access was difficult. But indeed the ancient population of

the country had before withdrawn to the peaks and ridges of the hills, if danger threatened, concealing themselves and t their possessions behind walls, defended these walled castles to the extreme in case of need, but from them always threatened the enemy, and at the proper time attacked those, that dwelt below in the land. Entirely as in Germany were conditions in France and England; Likewise in Spain the Romans must scarcely proceed otherwise. Even in Italy is the origin of the m mountain castle everywhere to be brought down to the middle ages, and referred to the influence of the Germanic races, w who had settled there.

Note 2. p. 17. Thus for example, the entire beautifully conceived book of G. H. Krieg von Hochfelden (Geschichte der Militär Architektur in Deutschland, etc., Stuttgart, 1859), is only to be used with the most extreme caution, since by the acceptance of Roman origin for so many castles, even the basis for the consideration of the others is displaced.

14. Walled Enclosures.

In Germany, France and England is yet a series of prehistoric walled enclosures in part of considerable extent. Others go back to the early period of our history. Circular or oval, arranged as far as permitted by the tops of hills, they could receive a large number of people. About such a nucleus was o placed a larger and wider enclosure in part following the slope of the hill at one side, partly surrounding the nucleus, everywhere clearly serving the twofold purpose of receiving the greatest possible number of people, then also men for defense, and at the same time making all those places inaccessible, that might be useful to the enemy, by including within the circle of defense. Earth and stones more or less regularly squared formed the materials with which the wall was constructed. Excavated ditches furnished them and at the same time gave greater height to the wall. Where rocky precipices e existed, they served; where nature had not done enough, art helped it out; the level places were regulated, the resulting earth and stone removed, as well as that taken from the rock, were added to the walls, so that it was not necessary to bring materials from a great distance for building the enclosure. But the forests that covered the hills furnished timber. This was now still utilized to a considerable extent in fortress

construction.

In the prehistoric period in order to give the coursed walls a more secure bond, when made of stone blocks in part of small size, timbers of small size were regularly inserted between the stones laid in courses without mortar, both as long sticks lengthwise the wall as in short pieces in its thickness, and thus by the timbers between the small and irregular split stones was produced an effect, like an arranged bond in regular masonry. In the historical period this use of wood in masonry first appears to have been omitted, although we also frequently meet with the use of separate timbers for similar purposes in structures of the middle ages. But besides the crown of the wall mostly had woodwork. We there have to think first of the breastworks made of palisades and of wattled work. Yet if we consider to what quick destriction by climatic influences such masonry was exposed, if it were not especially protected, then we cannot doubt, that the crown of the wall soon received protection by a roof, and since there under some conditions in a hostile attack could not be quickly removed, then must we indeed conceive the formal defensive passages of wood with covered roofs at a tolerably early time. Also of w wood must we consider all buildings erected, that served for shelter of the permanent inhabitants, as well as those, who fled with their goods to such refuges. We further should not doubt this, when we see, that the stone walls were so constructed as to require the enemy to take several successive lines, before he was at last in possession of the entire fortress, that also rows of palisades obstructed the access, and further enclosures of the whole, or formed easily handled separate parts, particularly the gates.

15. Masonry Fortifications.

This mode of construction in dry stone, earth and wood, was long retained and extended deep into the middle ages, through whose entire course we meet with it. It is not our problem to devlop here the peculiarities of this mediaeval earth construction, to examine more closely and to state the differences in plan and execution, how the walled castles of the prehistoric period differ from those of the Carlovingian, and these again from those of the late middle ages.[3] -- So much as necessary will be given later. But besides this mode of earth

and wood construction, there yet rises high the solid masonry based on Roman tradition, even if it was also more generally employed in Italy and southern France. In the North it still formed the exception. We have illustrated in the preceding Volume of this Handbook (1 st half, p. 124) the peculiarly d decorated masonry of a Frankish tower in Cologne, to which reference may be made here, and that shows us, how the Franks have restored the Roman walls with the round towers in their manner. Extensive remains of German military architecture are preserved in Carcassone, whose walls were rebuilt on Roman foundations by the Visigoths, that certainly a later restoration has again changed many things.[4] According to a document of the emperor Louis II of the year 874, the city of Piacenza had a doubled enclosure with towers and fortified gates;[5] R Rome had in the 10 th century 381 towers and 46 castles;[6] Milan had walls 12 ft. thick, 300 towers and several outworks.[6] In Germany, Hildesheim was fortified after the year 993 with walls and towers;[6] about the year 1000 bishop Burkhard rebuilt the walls of Worms. Likewise many castles in southeast G Germany -- we recall the Salzburg near Neustadt on the Frankish Saale -- already about that time received stone walls. Y Yet must we think of scarcely any works at the beginning of the 11 th century, of masonry of none too large stones.

Note 3. We refer for this to the very appropriate statement of G. Köhler: Die Entwickelung des Kriegwesens und der Kriegführung in der Ritterzeit, etc., (Breslau. 1886 - 1887), where in Volume 3, (p. 341-510) unfortunately without illustrations, there is g given a very instructive description of the military architecture of the middle ages, that has served us as a guide. The topic here considered is particularly developed on p. 379, etc.

Note 4. Viollet-le-Duc gives in Volume 4 of Archives de la Commission des monuments historiques, careful drawings and a also attempts at their restoration. -- Also see his Dictionnaire raisonnee de l'Architecture Francoise, etc. (10 vols. Paris. 1858-1868)., in different places, especially in Volume 1, under the Art. "Architecture militaire."(p. 345 et seq).

Note 5. See Muratori. L. A. Antiquitates Italicae medii aevi. Vol. 2. p. 454. (Milan. 1739).

Note 6. See Köhler. Volume 3. p. 348.

16. Castle and City Fortifications.

It lay in the nature of feudalism, according to which the master placed the sources of his power in the hands of others, that the intimate union must be gradually loosened; the power of the kings and of the empeeor diminished. The 11 th and 12 th centuries compose the period of progressive and embittered contests for the freedom of the feudal masters and the preservation of power over vassals. This ended about the close of the 12 th century with the complete independence of the latter. But thereby also the combined action of all powers for t the common defense of the country came to an end; every fortress, whether city or castle, was the more left to itself, t the more independent its possessor had made himself. For the development of military architecture, this was not unfavorable; for now the measures sufficed no longer, that were based on the united action of all. Each master sought to make his castle as strong as possible, and to secure to himself as many of these as possible. Particularly the emperor and the kings could only secure to themselves the remains of their power by a great number of castles, that they themselves possessed, and not their dukes. For example, the number of the Hohenstaufen castles is given as 350. Thus the 12 th century is t then the classical period of castle building. For the aspiring cities, who likewise sought to obtain their independence, the masters made great difficulties in regard to fortifications, they were satisfied by a strong castle dominating the city, thereby ensuring their interests, and forbade the city itself to erect walls, so that only gradually could the cities succeed in fortifying themselves in a comprehensive way, and that the classical period of the fortification of cities follows about 200 years later than that of castles.

Chapter 4. Plans of Cities.

17. Nature of Fortifications of Cities.

In general no special difference is to be made between the fortifications of cities and of castles.[7] Both, so far as p possible, carried a wall around a certain area, within which the colonists built for themselves houses and other structures. The larger were termed cities and the smaller castles, to which in the beginning of our period were added the monasteries as a third, that in their isolated situation must likewise be surrounded by a wall, which could be defended, until later they were themselves built in the cities. The wall was made as strong as possible, and the gates were fortified the best possible. Where the walls were easily accessible, and an undermining of them might be feared, they were strengthened by inserted towers; where this occurred, there was placed before the innermost line of defense a second, and if possible a third, and there were further erected outworks, particularly before the gates. Only one principal difference resulted from the peaceful purpose of the city. While the castle, wherever possible, had but a single and not very convenient entrance, since besides united friends and especially invited guests, no visits to it would occur, the cities must have a series of easily passed and convenient entrances, since they should serve the most extensive traffic possible. Traffic, w which must be excluded from the castle, must be led into the city. Not before the city, but within it were necessary travelers and merchants' goods. There the proper purchasers should buy, and only that should be carried farther, after they had chosen, which they did not need. Foreign sailors and wagoners, who brought the goods, were required to leave them, in order to give opportunity to the wagoners and sailors of the city to earn money by transporting them farther. The inhabitants of the vicinity should come to buy, and richly loaded with t the products of the artisans of the city and the foreign goods offered for sale there, again depart. The roads, that must p only pass far away from the castle, must extend through the city. The preservation of the safety of the city was thereby made substantially more difficult in contrast with a castle; meantime it belonged therefore to the duties of a good city government, to watch the more attentively and carefully over

this traffic, and to drive forth doubtful fellows, who had s slipped in, or to imprison them, to close the gates at the o proper time and to interrupt the traffic, as soon as this was necessary. Other arrangements for the defense of a city, than those made by the master of a castle, were properly not possible. If many city fortifications actually exhibit a different external appearance than the castles, this only consists in that most city fortifications belong to a later period than the castles, and that cities, especially in the later time, had at command more means than the poor master of a castle, so that it could arrange its works larger and with richer external decoration, than the possessor of a castle.

Note 7. Therefore to avoid repetitions, in describing the city architecture, we must omit to go into details, that indeed are also true for the city, but are better treated in the consideration of castles.

The castle of least extent is nothing more than the fortification of a single dwelling; the city is a castle of the greatest extent, a line of defense around a series of houses a and public buildings, many of which could defend themselves and were castles.

18. City Castles.

Every city originally had a large castle. Like the Roman c castle (castrum) this formed the proper nucleus. This should make the place in a military sense for the defense of the country, before whose gates the peaceful population settled, t their dwellings then being surrounded by a fortification, that formed an external line of defense of the city, that must be first taken, before the castle itself could be attacked. Certainly in every city this castle has not been preserved. Nearly everyone that desired to obtain its freedom, must wring it from the master of the castle, and generally enough led the contest therein, so that the city must first destroy the castle of its master before it owed him its freedom, and then could proceed in possession of freedom to build its own castle, i.e., to surround itself by a strong wall.

19. Plans of Cities.

If a castel had fulfilled its purpose, if men no longer needed it, its fate was decided; if not destroyed, it fell into ruin. Differently for the cities; since they did not serve e

exclusively warlike purposes, they were still further preserved, even when their military importance had passed, and they partly entered into greater prosperity, when their fortifications no longer had any purpose. A city found itself in continual development, and since few were so thoroughly destroyed, that they were planned and built entirely anew, then most older cities as now remaining, even if comprehensive alterations have not occurred in our own time, the history of their d development can still be read from the modern plans, and it is nearly everywhere the same history:-- first a small nucleus attached to a castle and enclosed by a wall; before the g gates arose suburbs; the city was enlarged, while men enclosed and protected it by another wall; according to the needs was this procedure repeated. Hence also the irregularity in the plans of most ancient cities, since already such a development was dependent on so many accidents of possession and inheritanceof the separate parcels of ground, but the city nowhere had legal means of compulsion, that gave it the possibility of regulating the streets, as such can be undertaken today.

Only certain cities are there, that did not pass through t this course of development, cities that are arranged within a certain perimeter (mostly relatively late) and have retained this extent. The fact, that each of such arrangements must be based on a definite plan, required for such cities a greater regularity. But there also was a basis of calculated and equilibrated conditions, since even every need for a city of definite size was more accurately determined, than where a city naturally arose and grew.

20. Marketplaces.

Of the most varied kind of internal requirements of a city were these, to be considered and cared for in the architectural arrangement. The first need was a great open space corresponding to the magnitude of the city, in its middle if possible, where the markets were held, but also where at market t times the people came together to hold a festival or to see themselves in free assemblage, they could stay or also discuss common and public questions. This place was termed the marketplace, the "ring" in Slavonic cities, doubtless because it w was round in the earliest times. Where men laid it out, a so-

square form as nearly as possible was chosen.

In cities that developed however, such a place no longer s sufficed, unless it could be extended; thus several were arranged, so that besides the chief market (also called the "green market") were still found fruit, milk, butter, wine, swine, horse, grain, hay, wood markets, etc., according to which the traffic in certain articles was transferred elsewhere from the chief market. Likewise the designation of "old" and "new" markets is recognized, as a later increase of market p places occurred. Men laid great weight on it, as the designation of the market was made according to certain wares, that all dealers had the same articles. The magistrates desired to watch the traffic and the dealers, as well as the quality of the goods. Buyers desired to compare and have a corresponding choice. But the sellers wished to compare the quality of their wares with that of others; but first of all they wished to keep similar prices fixed in common, which were again regulated by the magistrates, in order to protect the inhabitants from extortion.

21. Benches, Cloth halls, etc.

But the same condition also occurred for those goods not s sold in the open street, but at least on benches and tables, mostly by native artisans. Then we have the "meat benches" a and "bread benches", in many cities being the "shoemakers and other benches". Buildings were partly erected for them, particularly was there also a common "shambles" for the butchers, which we find in all cities. To the most important merchants serving traffic in the developed financial conditions of the middle ages belonged the dealers in money with their exchange bank (bank house, banker) or their table (trapezista). The m most extensive transactions were mostly found in the linen a and cloth traffic. The cloth halls are in many cities, buildings of very considerable extent and sometimes with great luxury of structural design and equipment. Where this did not a attain to a great cloth hall, men had a smaller cloth hall. Also sometimes common buildings were arranged for several k kinds of wares. Likewise all such sale places are found in the markets or their vicinity, as far as possible.

22. Weighhouse, Exhibition.

There was also a great public scales, mostly in a separate

building, where under the oversight of the magistrates the g goods were weighed, so that every man received his correct weight. There was also found the "exhibition", where all products must be brought, that must be sold only after public t testing, where quality was guaranteed by the city, since it formed an essential factor in the general commerce, in the industry and trade of the city, so that it was in the public intesest to strictly maintain the good repute of the products in opposition to underselling traffic, and those carrying on the industries. Spices, especially peiper and saffron, were there tested for their purity, and if found good, were packed and stamped with the city seal. Gold and silver wares were t tested for their fineness and stamped. Sword makers and armorers (makers of armor) must allow their wares to be tested f for quality, after which they could make their way, likewise furnished with the stamp of the city.

23. City Arcades.

Thus the main traffic was united at the marketplace. There stood the city hall, there dwelt the most prominent and richest citizens; their houses were the most secure in the city and presented arcades in the lower story, that then extended in the adjacent principal streets, within which traffic proceeded in the heat of the sun and the rainy weather, and where in part the benches mentioned found their shelter. They were for European cities what was the bazaar for oriental ones. Thus we find goldsmiths' arcades, cloth arcades, where there is no cloth house, or where it is not sufficient, shoemakers' arcades, etc.

24. Guilds and their Streets.

It was partly based on the traffic conditions mentioned above, partly on the military problem of the guilds, to each o one of which was assigned a definite part of the city wall, that the members of a guild dwelt together in the same street. Thus are the smiths', bowyers', cobblers', herdsmen's alleys, or as the appellation appears otherwise, the alleys "under t the herdsmen", "under the goldsmiths", etc. arose. Certain of these trades like tanners, dyers and others, were connected with the watercourses, mostly small brooks, that passed through the city; where brooks were lacking, there were canals o branching from the main river. Where the trade was not possible

in the city, places outside the city were assigned to such a artisans. But they must all exercise their trades under like conditions. For each member of them was designated the number of his helpers, so that a living was ensured to each, none n had to fear the competition of others, but all had the oversight of the entire body of artisans, as well as of the council of the city as to the goodness of the work and the price demanded, so that none could overcharge or deceive his customers. Thereby each street of the city had its individual character in appearance and its separate population, which felt as a unified society, in some sort as a family, and when it was cried out;"the butchers come", "the blacksmiths are coming", men knew when they marched out of the street to the marketplace or to the city gate, that not a single one of them thought or wished differently from all the others. The trade held with the council or was against it. One trade lived with another in friendship or enmity, never the individual.

Substantially strengthened was the corporate spirit by the fact, that the work was done on the street as far as possible. So the external appearance of each street was thereby influenced. In each street was a different kind of work, with its p peculiar life, noise and bustle, but in each only the similar appearance of those working, in each all houses originated u under the same conditions, therefore in magnitude, internal subdivision and external appearance like each other. In one hung the flag of the dyers on all houses, in another on open galleries were the hides of the leather-workers; there the ropemakers or locksmiths had their workshops open toward the street, again in another the goldsmiths had their shops, in which they placed completed pieces on exhibition. Thus the city presented variety in appearance.

Let us consider certain examples. We have mentioned the city of Carcassone (Lower Languedoc).

25. Examples:-- Carcassone.

Not far from the banks of the Aude (Fig. 1) [8] rises a hill, on which a castle might properly be built. [9] On three sides was this adjoined by a little city, wherein it must remain s striking, that just the fourth side next the river remained unoccupied at first. Was there some unhealthy swamp land? Were outworks of the city found there: A line of walls was con-

constructed by the Goths and enclosed this city. There still exists today the inner line of walls, some parts of which go back into that time, though rebuilt in the 12 th century. In the 13 th century was erected the outer second wall, in place of which were previously found palisades. Access to the castle was certainly originally located at the western side, so that the city had no direct connection with it, until in the 12 th or 13 th century the existing one was constructed. The city soon extended by suburbs; particularly were such found in the 13 th century between it and the water. They indeed a also had their fortifications; yet these were not strong enough, and at the siege of the city in the year 1240, the besiegers soon occupied them to the injury of the besieged. Meanwhile their fortification again later must also have been of such little importance, that a new external enclosure did not increase the importance of the inner one; with all later extensions, the ancient Visigothic wall rather remained the fortress proper.

Note 8. From Viollet-le-Duc. Vol. 1. p. 353.

Note 9. See Archives de la Commission des Monuments historiques. Vol. 4.

26. Cologne.

As a further example, that busies us more fully, we may place before our readers the powerful imperial city of Cologne on the Rhine, whose plan we reproduce in facsimile on the next Plate from a copper engraving of the 17 th century.(Reduced from the scale of 1 : 12000).

There are certainly represented thereon those fortifications, that were erected in the first half of the 17 th century. But it will be easy for the readers to conceive them as removed, so that they thus obtain from the plan an image of mediaeval Cologne. Local research has labored successfully to establish the history of the development of the city. [10] As may be perceived, Cologne belongs to those cities, in which quite early the castle -- we must indeed say the castle -- was torn down, so that not once in the plan is any remainder of it.

Note 10. See Cölner Thorburgen und Befestigungen. 1880-1882. Published by the Architects'and Engineers' Society for Lower Rhine and Westphalia. 1883. -- The principal part had Architect Wiethase, under whose name we shall cite the book, to wh-

which we hope to refer repeotedly in our work, without thereby desiring to speok more fully of the other outhors.

Men today believe it must be assumed, that the city of the Romans and Franks must have had equal extent, and have represented a line of wall in its ruins, that goes from the approach of the present Rhine bridge by the North side of the cathedral from East to West in a tolerably straight line to Apern street. On our plan this line to the Hoch street is marked by the street passing by S. Lupus (27), which corresponds to the former ditch of this line of wall. The Clara convent (22) designates the corner at which the round tower still remains, that we must designate as Frankish. From thence the course of the wall and ditch goes in a slight curve to the brook, that is visible in our plan, that comes from the West and enters the city at H, divides in two branches near 18, which discharge into the Rhine North and South of S. Maria Lys church. O On our plan is still indicated the gateway, which there led into the old city, where the brook divided. Parallel to this brook now ran the old wall on the South side of the old city to the Capitol. Yet the original form of the city next the Rhine must not decided from our plan. It is fixed, that two arms of the Rhine had cut out two great islands, on which churches S. Maria Lys and Great S. Martin stood. The main arm extended along t the points of our plan on which are placed the letters O and E, from which the curved course of the streets extended southeast to the Rhine and indicates the course, that the separating arm took, in order to flow behind the island of Würthchen visible on the plan, and into the still existing arm of t the Rhine.

Therefore the old city on the East must have only extended to the line leading behind S. Maria im Capitol, Little S. Martin, the City Hall and S. Maria ad gradus at the East side of the Cathedral to the point 27 on our plan. This line, as here represented, is likewise the enclosing line of the Frankish city. [11] Therefore it is unimportant for the investigation, and it may onln be noted, that we hold and are convinced, that the enclosure is not that for the Roman but the Frankish city, and that the Roman city was substantially smaller, so far as it was fortified.

Note 11. Wiethose depends here on an investigation of the

architect Michael Kotz, that was published in the Programme of the Oberrealschule at Cologne in 1882-1883, to which we a also refer. It lies outside ouh problem to prove here, why we hold this course of wall and ditch to be not Roman but Frankish, that was followed and firmly established by Motz. The R Roman castle (castrum) uncovered in Deutz shows, as Wiethose also states, entirely different masonry, and since both castles at Cologne and at Deutz supplemented each other, their s similarity is not to be doubted, and thus similar masonry is to be expected. If we must express an opinion, we assume that the Roman city was originally limited at the South by the line of our plan, that passes beyond S. Maria im Capitol, West through the Hich street, North by the street between the Cathedral and S. Lupus. Originally perhaps the Northehn limit o of the castle (castrum) may have even been behind the City H Wall. Whether even in Roman times occurred an extension of t the castle (castrum) seems questionable to us.

Where stood the royal castle of the Frankish city? Indeed on the Capitol, where Plectrudis, the spouse of Pepin of Herstal, that founded the Maria convent. The bishop's or archbishop's castle, which dominated the city, when this belonged to the archbishops, likewise lay near the cathedral. Other castles will be mentioned later.

Before this city, that indeed had narrow streets inside, b but still was not to be termed particularly irregular, in which two straight streets intersect each other, there were found suburbs, of which the western S. Apostles included all to where the figure 20 stands on our plan, as far as the continuation of the West-East street, passing beyond the Clara convent. Another suborb was found on the North side, enclosed by the curve passing through the points marked 23, that extends to S. Cunibert (33) and enclosed the Ursula convent. (31). 12
Another suburb adjoined on the South, extending to the broken line as far as the island Wörthchen. The importance of all t these suburbs is based here as everywhere first on the fact, that the city gates were closed early in the evening, and a strict control at the gates for both persons and goods, that entered the city. For there then existed places on which gathered those not admitted, smiths and other artisans, also primarily bakers, oath men,and peddlers lay down in the streets,

that here were far wider than in the interior of the city, to afford space for the wagons remaining here for the night. Wealthy citizens possessed gardens there; gardeners cultivated those of the finer vegetables necessary for the city. There arose the great monasteries, that found no room in the interior of the city, and even were surrounded by walls forming s separate fortresses before the city, before whose gates artisans likewise settled. These fortresses could even be utilized against the city under some circumstances, and at most cities in this was the chief motive to include the suburbs and these fortresses within the circle of the city. In Cologne t this occurred after the middle of the 10 th century. After 1021 the inclusion terminated. By the annexation of each such suburb the irregularity of the city pan was increased. In any case the eastern part with S. Martin monastery was first included, the other suburbs mentioned, at the close of the 10 th and the beginning of the 11 th century. In the course of the 11 th the great monasteries were particularly extended by new adjacent structures, and in the course of the 12 th must also have been annexed S. Gereon, S. Mauritius, S. Pantaleon and S. Severin, so that the walling of the city was arranged, as we see on our plan, and which was first removed after for a few years it had formed a part of the modern citadel. The time of 1180 to 1200 is given as that of the erection of the n new enclosure; yet this first refers only to the wall and ditch by which the city was surrounded, while the next centuries were engaged in erecting and completing walls, towers, gateway castles. The enclosure, as it was retained by the city at the close of the 12 th century, was partly executed in independence of the archbishop. As in the old enclosure he indeed held the strongest points, the gates, he may also in the new have retained strong points, castles by whose possession he had the city in his power. At least at the Boyen gate was found one such, that in the 13 th century was taken and torn down by the citizens. The archbishop's castle near the cathedral may then have been unimportant, but in the 13 th century was it similarly torn down, when the grand rebuilding of the existing cathedral was planned, and just its removal may have afforded indeed so much free space, as our plan shows in the vicinity of the cathedral. Also the citizens of Cologne

would scarcely have patiently endured such a castle so near their city hall, strongly fortified according to the custom of the time.

Note 12. It is only an error in our plan, that by 31 not the Ursula convent is named, but the unimportant chapel of S. Renchen.

The enclosure of the city likewise became so surved by the inclusion of the suburbs, as we see it today. It therefore needs not the assumption, that particular principles of military architecture gave occasion for this. We must leave it to the authorities in the domain of strategy, whether as certain writers assert, the plans of such curved fortifications afford such advantages, that they are not regarded as accidental, b but as well considered. We believe, that where a city had a nucleus, its gates designated the definite direction of the suburbs, whose growth alone determined what its external enclosing line at last became.

Let us glance a moment more into the interior of the city. We shall certainly not have to assume now, that all those areas in the interior already givey as gardens on our plan, were already in the 12 century areas free from houses. Since t the length of walls must be brought into accord with the number of defenders, thus of inhabitants, there was nowhere given to them an unnecessary length by inclosing great unbuilt areas, and thus not in Cologne. There already was space enough by the great Church foundations, by the churches, by the public buildings for administration and commercial purposes, on which the defenders could dwell. Thus men would not have enclosed unoccupied areas, unles at least their immediate settlement was in view; places were hardly created purposely, w where unnoticed by the resident citizens, fellows of all sorts could gather behind high garden walls, in order to make a surprise attack on the city wall from thence. Men were required to make the streets very narrow so as to bring the most defenders possible on a small area. As in every city, we see in Cologne also wider streets only where these formerly belonged to the suborbs and lay outside the older fortifications, but led to older inner gates, and about where an old city ditch remained a longer time, and by ceasing the internal defense, settling the old course of the walls with space not suf-

sufficient for two streets. From each gate of the city a connecting street goes toward the centre. The long straight street from North to South (Hoch St.) was the chief artery of traffic; therefore to it led by the shortest possible ways the streets from all the gates, which extended outside the gates as country roads, it is even everywhere connected by cross streets with the bank of the Rhine. But if the streets were narrow, then the life in Cologne required the largest possible free spaces in the midst of the narrow streets. We then also find such abundantly provided in old Cologne, as in many other cities. First these free places also served a around the churches as cemeteries; but also marketplaces were largely provided. The filling up of the old arm of the Rhine, in which men were engaged in 1140, and that may have been completed about 1200, since in 1174 a contract with the archbishop on the occupying under a fixed ground rent for each building site was agreed on, gave opportunity to lay out two great regular places, the old market C of our plan and the hay market B. Later than this in any case, judging from the name, is the plan of the new market at the East of the Church S. Apostles. The free space at the East of Church S. Gereon (24), t that West of the Church S. Apostles, where is no. 21, then at 20, and then where today the Moltke monument stands, North of Little S. Martin, a place West of Little S. Martin, where the Bismark monument now is, a place North of S. Severin indeed did not originate when our plan was engraved, but goes back to the middle ages.

The walls, gates and towers will be mentioned later.

27. Friesach.

Beside the mighty city of Cologne we place the example of a little city, Friesach in Carinthia, [12] that received its walls at about the same time as Cologne, acquired its present plan in southeast Germany, but under entirely different conditions and requirements, and therefore neither then nor later could obtain the importance, such as Cologne had.

Note 12. Hohenauer, F. L. Die Stadt Friesach. A contribution to the secular and ecclesiastical history of Carinthia. K Klagenfurt. 1847.

Oesterreichs kirchliche Kunstdenkmal der Vorzeit. Lief. 5,6. Friesach in Carinthia. By H. Hermann. Vienna. 1858.

Essenwein, A. Die mittelalterlichen Kunstdenkmale der Stadt Friesach in Kärnthen. Mitt. der K. K. Cen. Comm. for examining and preserving architectural monuments. 1863.

Friesach was well located on an important traffic route; b but it only served as a military station to control this road. Neighboring cities had trade privileges lacking to it, and t thus it remained restricted to the magnitude it originally h had, and that were firmly retained, however frequently it was rebuilt in consequence of destruction. We give in Fig. 2 [14] t the plan of the city at the same scale as that of Cologne (1 : 12000). At the close of the 9 th century was the place first mentioned, being designated as a village in 928; in the year 1015 it was raised to a market with a custom house, and in the second half of the 11 th century it found itself in t the possession of the archbishop of Salzburg, who elevated it to a city in 1072. It was the fortress of Petersberg, at the foot of which settlers had gathered, which then received city rights. Besieged in the year 1090, the city was taken without the fall of the fortress; it was even in 1131, when archbishop Conrad I began in 1124 to fortify the city anew. This fortification has remained in its essential parts until today; at least the city ditch, which is fed by springs and extends from the Petersberg to the Vigilienberg, belongs to that time. In the battle of Rudolf of Hapsburg, at whose side stood the archbishop of Salzburg, with the Bohemians, the latter conquered the city, that 20 years later was again taken by archbishop Albert of Austria and destroyed. Thus the details of fortifications, of battlements of the walls, the gates, etc., m may belong to the close of the 13 th century and to the 14 th century. Archduke Rudolf conquered the city in 1395 after a brief resistance. As a military station the city was the seat of many nobles. At castle Petersburg the Salzburg archbishop resided only exceptionally; but his suffragan and vicegerent, the bishop of Lavant had his residence there, and history speaks of festivals and visits of the emperor in the 12 th and 13 th centuries. Particularly the tourney held in 1217 has b become famous by Ulrich von Lichtenstein's description, that Leopold the Glorious of Austria held, and at which 10 ecclesiastical princes and 600 knights were present. However important accordingly the splendor of the city must have been sometimes, yet the greater wealth is not mentioned, that the ext-

extended traffic of citizens might bring. The architectural style of the houses was certainly very primitive during the entire middle ages and even later, and aside from the destruction by wars, a series of conflagrations [15] was increased by the defective mode of construction and faulty precautions, and restricted the development of the city.

Note 14. From a drawing by the author.

Note 15. Such that laid in ashes the entire city, or at least more or less larger parts thereof, occurred in 1308, 1340, 1384, 1455, 1461, 1493, 1557, 1582, 1652, 1673, 1752, 1804 a and 1816.

Let us consider the plan of the city in Fig. 62. In the West rises a mighty mountain range, at the foot of which rise three masses of rock in the plain of the Metnitz valley, wide here, through ran one of the roads connecting Germany with Italy, that first led from Knittelfeld, Judenburg, Neumarkt past Friesach to S. Veit, Klagenfurt and Villach. The mightiest of these rocks is the Petersberg, with a long and narrow top adapted to bear a considerable castle, and which was also then first fortified. For ascent to it served a road extending from the South point at the foot of the rock, extending around it on the West, North and East sides,and again on the South side almost over the beginning leads into the interior. Before this beginning of the road and thus below the South point settled the people, whose central point was the street that leads to the Metnitz in a straight line from the way of ascent and from West to East. On it was formed the marketplace. From thence a street ran to the foot of the Petersberg along to the Neumarkt gate (4), appararently parallel to several o others. Behind the marketplace and at the foot of the rock, the monastery church with the houses of prior and canons found place. The southern end of the city was characterized by the second rock, the Virgilienberg, that in both sieges, that had given occasion for the rebuilding of the city fortifications, was fortified by the enemy with a castle, and therefore must be included within the fortifications. Likewise had been substantially utilized a mountain spur approaching the city from the mountain range almost parallel to the Petersberg. I Its end was therefore taken into the city (red tower). The third hill of rock, the Geyersberg, was too far from the cen-

centre of the city for this to be extended at once to it. Therefore it received a separate castle; with the extension od the city it was then likewise included within it. Doubtless there were also found here early settlements of citizens, as in other cities, that formed suburbs outside the city in the Metnitz valley. The Dominicam monastery founded in 1217 was located before the city in 1251; already in 1230 the Teutonic order of knights existed in Friesach, and had its house of t the order southeast of the Virgilienberg. Thus are found everywhere ruins of walls and towers, that these suburbs formerly comprised. We have outlined them in dotted lines, and have marked their towers by numbers 17 to 22. The importance of t these suburbs was however little enough, since the line of t the external walls was not maintained. The popular tradition is that these remains of walls are not later, but belong to an earlier period than the main walls, that the old city of Friesach was far larger, and only in the 12 th century was reduced to the present circuit. From what they actually date is hard to say on account of the formlessness of the existing ruins, and it can only be conjectured, that it was about the 14 th century in which these later omitted fortifications of the suburbs were executed.

26. Saona.

The great difference between the plans of different cities is essentially based on the fact, that for each city the conditions of the locality and historical traditions were different, and therefore different results occurred everywhere. But the procedure was still the same. Nowhere prevailed chance a and caprice; there was always a series of primitive factors, that had a determining effect and from which the result proceeded, as just shown to us. Therefore entirely different, than if on a river and in a plain, must a city be formed in the mountains.

A number of cities were built by Europeans in Syria [16] in the 12 th and 13 th centuries; even there no principles prevailed, other than those in their native land; likewise there were castles, built where need required, on the apex of the hill or on the seashore, as extensive as space allowed and as circumstances required. Also there everything was utilized, that nature offered, and all was supplied that she refused.

Men had governments of the European kindbased on the principles of feudalism introduced there. The conditions of monarch and subjects nere also similarly arranged, and likewise also therefore the relations of city and castle. We then select an example of a mountain city there. In Fig. 3 [17] we give (also at a scale of 1 : 12000, like the other city plans), a sketch of the plan of Saona (now Sanioun). [18]

Note 16. Se Rey, E. G. Etude sur los monuments de l'orchitecture militoire des croisees en Syrie et dons l'ile de Chypre. Poris. 1811.

Note 17. From the some. p. 107.

Note 18. See the some. p. 105 et seq., ond Plate 12.

Located on a mountain ridge between two narrow and steep r rock canons, the city consists of three parts, whose middle fortion is separated from the western and eastern parts by moats cut in the rock, and bears a vast castle A, to which we shall return later (in the description of castle plans). Of the western part B the greater portion of the enclosing walls may be recognized. Placed lower, in a manner securing the foot of the castle toward the place, where the two valleys unite, it appears as a part of it. We are not instructed as to the former course of the road. The fact that the entrance from B lay close to the northeast angle must indicate that the road on the western side, beginning at the point of the projection of the hill, led northerly over the entire plan, and that not far from the corner of B a short branch passage across the m moat ended at the gate, so that besiegers daring to use this road must first pass along the walls of the little city B, t thus its entire forces offered to the defenders standing on the wall their right sides, unprotected by the shield. If they then turned around the corner to win their way over the m moat to the gate of B, they had before them the defenders of B, behind them those standing on the walls of the castle A. The area of the little city B is very small, and the fact that was exposed to the first attack, it must then have been o occupied by the best part of the defensive troops. Little more can be said of the internal arrangement of the small city. A church lay in the vicinity of the entrance. Doubtless there existed a connection of B with the castle A across the moat cut in the rock, which is no longer to be recognized. The road

to the Eastern part now led farther along the North wall of A, well below the wide moat, and also along the North wall of C; rising there, it may have led to the northeast corner in the little city C. Walls and buildings there are only a jumbled heap of ruins, allowing details to be recognized no longer, so that in Fig. 3 only by a dotted line can be approximate p perimeter of the little city be indicated. Through this and near the North side led the main road to the castle A. The m moats, cut in the rock and separating A and C, arouse the astonishment of travelers; a massive stone obelisk left standing in the middle formed the support for a bridge, and it especially surprises travelers. The chief interest of the plan, aside from the great ratio of the castle to the city, is the fact that the city is entirely separated into two parts, in order to ensure to the castle the most favorable position in the middle.

Naturally nothing is to be said of the history of the development of this city. There already lacks space for it, the decline of the Christian states brought a sudden end to the cities and castles of Christian Syria. The plan dates from the 12 th century. Already in 1187 Saladin conquered the city and castle; it later became the chief place of a petty Arab principality; but because unimportant, the means of defense fell into ruin, such as the strong buildings, and the little city gradually sank to a village. We have a very instructive Arab report of the conquest, from which the weakness of the fortifications of the city is apparent, as well as the care with w which the Mohammedans utilized them. We shall also return to this later.

29. Giblet.

Also for another case of a city plan we select an example from Syria. A city serving to defend a safe landing place on the seashore is Giblet (Dbeball),[19] whose ground plan we reproduce in Fig. 4.[20]

Note 19. See Rey, p. 115 et seq.; 217 et seq, as well as P Plate 21.

Note 20. The same. Plate 21.

On the rocky coast is a place slightly recurved, that extends in a sandy shore. A long reef of rock rises from the sea and runs a short distance before it. In Fig. 4 this rocky reef

is designated by B, while A denotes the harbor, separated from the sea by some embankments and found behind them. A hill G gave room for a castle, before which and gradually rising from the sea extended the little city, enclosed by the wall in straight lines B C D E F, which is strengthened by a series of towers, two of which dominate the entrance to the harbor, that could be closed by a chain between them. A series of harbor cities must maintain open connection with the West, a and one of the principla places for this was Giblet. The harbor cities also generally remained longest in Christian possession. In the year 1109 a Genoese fleet had taken the place, that was especially suited for a landing place. It appears to have been fortified soon afterwards. Meanwhile, however strongly fortified it was, yet Hugo III, lord of Giblet and captured in the battle of Hatten, must relinquish it to Saladin as a condition of his freedom, who destroyed a part of the f fortifications. Only in 1197 the city again passed into the possession of the master bearing its name, until in 1266 it was forever lost to Christian rule. The population of the city today consists in part of Catholics, to whom was also left the old Gothic Church of S. John. While the castle passes for a work of the 12 th century, the walls of the city in their lower parts are regarded as one of the 13 th century. Yet only for a small height do they even belong to the middle ages, but in their upper parts are a work of the Turkish government.

The internal plan of the city, of which only the higher eastern portion has regular streets like a city, presents no f further interest. Besides access from the sea, the city had at the north side a gate C, later walled up. Did this extend back into the middle ages? Doubtless on the north or east side under the walls of the castle a second and no longer existing gate led into the interior of the city.

The rectilinear plans of the castle and of the city wall of Giblet inform us, that in the middle ages when appropriate, men employed straight lines and right angles just as gladly as in later times. Other plans of the crusaders in the Orient also show this to us (for example, Caesarea).[21] Certainly we also have to regard the interior of the city as arranged regularly and with straight lines, like the course of the walls.

Note 21. See Rey, Plate 22.

30. East European and French Cities.

Besides the ideal phenomenon presented to us by the crusades, that is shown to us by a multitude of inspired, pious and brave men, who left homes and families to devote their powers to the honor of God in dangers of all kinds in foreign lands, there present also a very material side. If then a great number of crusaders would find rule and possessions or at least livelihood suitable to their rank, that in the form they desired was furnished them by the conditions of their homes. In other words, Europe had superfluous powers, that it expended in colonizing countries, which in antiquity were seats of a high civilization, but under the rule of Islam had fallen into ruin. As gradually this diversion of superfluous power found obstructions in its way, men found that Europe itself offered land enough suitable for colonization, where particularly the activity of the citizens could still find a place, at which they would be welcome. Hungary and Poland, also the lands lying farther east, so far as they adhered to the western Church, needed the cities for manual activities, as well as to present safe places for trade and traffic. Then we see a great series of cities founded in the east of Europe, that particularly attracted German citizens, and while producing rich gains for them, were brought by them to greater civilization. All these cities, so far as they were located in the plain, exhibit a regularity of plan surprising to all, who have seen no other mediaeval cities than those originating g gradually, which were mostly obstructed in development by peculiarities of the ground, receiving that irregular appearance in the interior and on the exterior, that seems so romantic to us, but which is only the result of compulsion of circumstances, that men bore only because they must.

But also in the midst of the countries, where was most highly developed the civilization of the middle ages, there was still room for new cities, and we see an entire series of them arise in southern France, entirely regular in their interiors and exteriors, arranged with straight lines and right a angles, where the least departure from regularity of plan is to be referred to definite external requirements.

31. Examples. Aigues Mortes.

We give in Fig. 5 (at the scale of 1 : 12000) the plan of

such a little French city, Aigues Mortes, [22] south of Nimes, that originally lay on the seashore not far from the mouth of the Rhone, but whose harbor was filled with sand by the recession of the sea, yet for which the marshy surroundings still affords a strong location in the plain.

Note 22. From Annales archaeologiques. Vol. XI.

32. Cracow.

An example of such a regular plan of a German city in Poland is presented to us by the chief part of the old royal capital of Cracow, [23] where indeed this regular plan only forms a portion of the general plan extending in free development. Fig. 6 gives (at the same scale as of the other city plans) that of Cracow.

Note 23. See Essenwein, A. Die mittelalterlichen Kunstdenkmale der Stadt Krakau. Leipzig. 1866.

The beginning of the city is also to be sought here in the hill Wawel, that rises on the bank of the Weichsel and bears the royal castle with the cathedral. The situation was favorable for traffic; a road led north from Hungary, and another from Germany crossed it here; from very ancient times therefore, a permanent settlement was found here, that found itself in the hands of the Bohemians at the close of the 10 th century, from whom Boleslaus of Gnesen took it in the year 999. Again when duke Mieczylaus died in 1035, the Poles murdered the Christian priests and again introduced pagan worship, the Bohemians conquered Cracow, that rose again toward the close of the 11 th century, after it was taken and destroyed by the Hungarians. Injured by a conflagration in 1125, the city was devastated in 1241 by the great campaign of the Mongols, whereupon duke Boleslaus V by the introduction of German inhabitants founded a new city of Cracow with adoption of Magdeburg rights. The Mongol hordes repeatedly invaded Poland and injured Cracow, that only in 1287 could resist them behind its f fortifications. On the plan and the extent of the city it is to be stated, that the ascent to the castle hill was found at the northeast corner, and that as everywhere so here, the city developed before this access.

Of its oldest form and extent little is known; it appears to have had a tolerable enclosure; for at least the founding of churches far apart, like S. Florian in the north and S. St-

Stanislaus in the south, is referred to the early time. The mode of construction in wood indeed brought with it, that conflagrations and war could very considerably injure the city. But also we do not have to regard in any wise the entire city as a unified group. [24] There might stand here and there certain groups of blockhouses surrounded by wall and ditch, which is indeed confirmed, since the separate parts of the city already early bore special names. The church buildings were surrounded by monasteries, and partly fortified as independent architectural groups, lay at considerable distances from the other groups of buildings. Before the gate of each, as everywhere, may have been a small settlement. When now the city must be founded anew about the middle of the 13 th century a after the Mongol invasion, only the ecclesiastical probably were so fixed, that the new plan must take them in consideration. For this new plan the most suitable area was found on the northern plain, where a number of streets crossing at right angles could be arranged with a great open space, the "ring" in the midst. The direction of these doubtless resulted from the fact, that the connection with the monastery of S. Florian on one side gave a definite line for a main street line, on the other side the already existing church S. Maria indicated a terminal point of this street. Thus resulted the direction of the ring; from this followed the arrangement, a and doubtless the first fortifications were arranged around the city as a regular rectangle. The Franciscan monastery, w which lay directly outside the rectangle, may have been included as a right-angled triangle adjoining the rectangle, so that the gate stood near S. Peter. A connection from the ring outward must have been created according to the other parts lying outside this fortification. A street corresponding to the diagonal from the little church S. Adalbert outward afforded this connection, and could be extended direct to S. Leonnardt on the Weichsel. What sort of fortifications could r resist the Mongols in 1287 we do not know. But it should not be a false assumption, if we assume that these only consisted od a wall and ditch; for already in 1298 duke Wenzel enclosed the city by strong walls and at the same time fortified the castle, which in 1265 Boleslaus is expressly stated to have rebuilt in wood on the Wawel. Certainly in one year was not

completed the building of a stone walled enclosure, like that of Gracow, and the date of 1298 indeed denotes the beginning of a slowly completed transformation, that was executed in t the course of the 14 th century, but first completed in the 15 th and perhaps in the 16 th century. Aside from the fact, that such an extensive construction required time and means, that were not to be provided in one year, it was not possible to remove at once the entire fortifications of the city and to begin anew, since the city must not be defenseless for a moment, because otherwise everyone would have made use of this defenselessness, who desired to get the city into his power. Rather must this have proceeded gradually and slowly; never must a greater piece be open, than under all circumstances could be defended against an enemy.

It must be regarded as a rule, that where it was necessary to first build the new wall before or behind the old one, according to the conditions of the adjacent civic or ecclesiastical establishments making this possible and necessary, it must stand complete, before even a small extent of breach in the wall could be made. Walls and towers could seldom be erected at the same time; generally the walls must stand first; only then were the towers added. Only when the main walls could safely be defended, at their base instead of the palisades that must form the enclosure till then, might be erected the front or outer wall, the moat be excavated and gradually widened. In every case must one proceed here according to the momentary and local conditions inside and outside the city, always at right and left seeking the junction of the new and old. Thus it is nowhere surprising, if irregularities in the course of the walls resulted from this procedure; we find in many cities quite striking junctions of a part of the course of the wall [25] to the other parts or at gates and towers.

25. In reference to the walls of Cologne, Wiethose calls attention to several such cases.

Therefore we must not be astonished, that in Cracow the beautiful square, according to which the wall was doubtless laid out, that surrounded the city in the 13 th century, was no longer retained in the enclosing wall of the 14 th and 15 th centuries.

As also stated above, in case the city in the earlier time

was entirely separated from the castle and stopped near the Franciscan church, and the space between the castle and city was occupied by swamps and was uninhabitable, yet since S. Andreas as well as S. Martin and S. Egydius go back to the e early time, then under all circumstances the connecting street, on which about 1400 church S. Maria Magdalene was founded, and on which also Ss. Peter and Paul stood in the 15 th century, must have existed already in the earlier time. It is therefore next to assume, that also in the 14 th and 15 th centuries in addition to the line of walls about the new plan of the 13 th century, the part of the city lying between it and the castle was walled; on the east side as it still stood at the beginning of this century, on the west side as we have i indicated by a dottel line. A rebuilding of the bishop's palace required the city wall to be broken through at this place in the 17 th century, evidence that already then, this no longer had the proper importance as a fortress.

This walled city also had its open suburbs, that however in the middle ages were no longer enclosed by a common wall. On the other hand on the island in the Weichsel in the south was built the city of Casimir, which received from king Casimir the Great in 1335 city rights, and doubtless also then its f fortifications. Although the city of Casimir was not much inferior in size to the sister city of Cracow, the fortifications had still no particular importance. Nevertheless the course of the wall exhibits something instructive. On the Weichsel it followed quite accurately the curvatures of the river; since just on the inside of the curves sand was usually deposited on the bank, so may the case have been here also, that previously the shore of the river actually washed the base of the wall, as represented in the Schedel Chronicle.[26] It is to be recognized on the west side, how the wall was built against the rock, where adjoining S. Stanislaus church on Skalka.[27] How greatly men considered the conditions of the ground particularly occurs on the east side, where the wall is sharply incurved, since a gap was in the way, that was an obstruction in the interior, but externally served as a further protection, just as a similar one also appeared farther north, and d determined the northeast angle of the city wall. Otherwise the wall shows how such a plan was created before it was str-

strengthened by towers; for although the view of the Schedel Chronicle shows us a rich series of towers, such as the city of Casimir could never have had. Doubtless the means never s sufficed to assure this strengthening of the city wall.

Note 26. See Schedel. Liber chronicorum, etc. Nuremberg.1493.

Note 27. "Skolka" in German = rock.

33. Nuremberg.

The example given above by representing the development of the city of Cologne, essentially closed with the 12 th century, even if the details of the city fortifications partly belong to a far later time. If then Cracow affords an example in which the centre of gravity of the plan lies in the 13 th century, and the fortifications are substantially to be regarded as a work of the 14 th century, we now still have to give as an interesting example a city, whose development in area continued to the close of the middle ages. Such an example is presented to us by Nuremberg, whose plan (at the scale of 1 : 12000) is given on the adjacent Plate.[28]

Note 28. From that published by the Society for the History of the City of Nuremberg, the plan compiled by M. Boch.

From the broad valley of the Pegnitz rises a hill of rock, whose western portion falls abruptly, while the eastern joins the slope extending from the foot of the hill into the plain. With its broad top, this must be taken as one of those prehistoric walled castles mentioned above, that presented a particularly adapted area, and therefore it has been assumed in r recent times, that it bore such a one, and it is believed that remains of it have been found. The question for decision, how far this is actually the case, lies outside our present problem. In any case can be no doubt, that at the time when Henry I extended his network of cities and castles over Germany, this hill had a castle. Reliable historical statements of this do not exist, and first under Henry III, who gave out documents there in 1050 and 1051, is first mentioned the castle (castrum). Of the city itself mention is made much later, although no doubt can exist, that it also had long existed, when it was mentioned for the first time.

This castle, which aside from later alterations and additions is preserved in a rebuilding of the 12 th century, will be thoroughly treated later. Its access lay on the southeast

so that naturally the first settlement lay around the eastern side of the hill, and the road from the gate of the castle to the water in its upper part formed the chief artery of traffic. It is designated in our plan by its old name of "Under t the Fortress". From the western end of the castle to the south end of this street, where church S. Sebald now stands, there was a steep street down the slope under the name of "Bag" street, with some little connecting alleys between the streets running from west to east in slight curves. This group is hatched darkest in our plan, and thus attracts the eyes at o once as the beginning of Nuremberg. It is interesting, that still today the names of upper and lower "Smiths' alley","Grocers alley", "Soldiers alley", allow the relations of the population to the castle to be recognized. The northwest angle of the city is designated as the "Gate of Zoological Garden", evidence that once a zoological garden was there at the foot of the castle, which must have existed in very early times, since history knows nothing of such a one. On the south side of this oldest architectural group stands the older chief church of the city, the Church S. Sebald, which by tradition is likewise placed at a very early time. Yet without any historical proof are we, as to when that architectural group extended south to the Pegnitz; we might therefore assume for it a very early time, and have therefore drawn on the plan the enclosing line below. Certainly neither in the city nor in the castle would one refuse the enjoyment of fish; mills could o- only be erected on the water, and we cannot conceive a city without the laundry women at the bank of the river. Certainly this lower part lay in the flooded region; the place where t the Augustinian monastery was built later, the frogpond was a swamp, and the meadow on which farther away in the 14 th century was erected the Hospital of the Holy Ghost, may in the 11 th have extended over the present marketplace. Yet ruins of buildings are found, that doubtless belong to the 12 th c century, at certain houses on the west side of the market, and when some years since the houses south of the city hall were newly stuccoed, the old stucco therefore being removed, there appeared on the entire length of the facade those characteristic window galleries of the 12 th century, which we s shall later know better. If the city already in the 12 th cen-

century had extended over the Pegnitz is not proved, yet is nowise impossible. To the beginning of the 13 th century belong parts of church S. Clara, that lies tolerably distant from the water, thus then in any case finding itself outside of the city fortifications.

What now concerns the city fortifications is than neither have any remains been preserved, nor have we any reliable historical statement. Tradition already knows of an "extension" of the city in the 12 th century. In the year 1105 a "siege" and "capture" are mentioned, as well as in 1127. The Scotch monastery of S. Egydius founded by the emperor Conrad lay outside the city, which must have been enclosed by wall and ditch, judging from all these events. Its perimeter may perhaps not have always been the same; certain parts may have been g gradually included, others remaining outside as suburbs. These portions were now enclosed by one wall, that on our plan clearly appears as the second phase of the development, so m many remains of which are preserved today, while others were only removed a few years since, about which so many documentary statements exist, that in their entire course they can be accurately determined. But none of these documents gives us the time, when the enclosure was commenced. The existing remains are from different times. As the oldest is represented the lower portion of the "white tower", the gate tower at the most western end of the city on the south, i.e., the left bank of the Pegnitz, which belongs in the 13 th century. But at the time of its erection already existed the house of the Teutonic order. Since this was founded in the beginning of t the 13 th century, and did not lie within the wall mentioned, that may have been erected earlier; only even the gate being restored in the 13 th century, and the tradition be correct, which places the building of this second wall in the time of the Hohenstaufens, when it must certainly be assumed, that it was later gradually and completely rebuilt; for what of it e exists, excepting the few remaining parts mentioned on the w white tower, clearly shows by its forms the 14 th century as the time of its origin. The so-called "debt tower" on the island of (chütt, that may be clearly recognized on our plan, shows by an inscription of the year 1323 as the date of construction. Other parts are still substantially later. The gen-

general course may well be followed: -- earth and wood may h have served as materials for the wall in the 12 th century; in the 13 th and 14 th centuries stone construction may have gradually appeared in their places. Meanwhile before the gates also this wall in the ordinary fashion may have formed the suburbs, that it was necessary to include, and still in the 14 th century men began, first indirectly the completion of the rebuilding of the inner city wall, the erection of a new enclosure, that consisted of a doubled wall and a ditch, and at the beginning of the 15 th century was at least substantially complete, even if certain parts were later added for strengthening, or in consequence of a simple rebuilding received their existing form. Such rebuildings occurred even in the 16 th and 17 th centuries, so long as men held it possible to adapt the fortifications of the 14 th century by such structures to the needs of that time. It is worthy of note, that at the close of the 14 th century men nowise did men think of a abandoning and destroying the second serving till that time, according to the plan of the third new and extended fortifications. This was rather still carefully retained even in the entire 15 th century. Even at the close of the 15 th century the internal "Laufer gate", one of the principal gates of the principal gates of this internal line of walls was built anew. The portion of the city lying outside this inner circuit of walls was always regarded as a "suburb", although it was enclosed by the massive external wall, and although in 1499 the sale and customs hall was already built in the city moat of the inner enclosing wall, and in the course of the 16 th century the house of the Landauer brothers -- and the arsenal i interrupted the inner fortification. The patricians indeed h had great gardens within it, especially on the east side; there were found the Catherine, Martha and Clara convents, as well as the Carthusian monastery and the house of the Teutonic order. But mostly only persons of little importance dwelt there. Those wealthier all remained in the interior of the city. This arrangement, as our plan shows, sheltered at the time the greatest prosperity, thus in the middle of the 16 th century, about 40.000 inhabitants, and in the 15 th about 2. 2.000 men may have been available for the defense of the city.

34. External Appearance of the Cities.

34. External Appearance of the Cities.

The external appearance of such a mediaeval city was extremely imposing. The walls with their numerous towers, the great city moat, over which bridges led to the gates, and beyond which some outlying works projected, behind the walls being high roofs and great gables of houses and public buildings, partly furnished with towers, from the midst of which arose proud churches with lofty towers, presented a surprising view, whether a city extended up the slopes of a hill, that was crowned at top by a castle, or whether in enclosed several hills or extended in the plain. Each city presented a characteristic view, that amazed the foreigner, and filled the native with pride. And if the inhabitants of these lands to which n nature granted mighty hills, loved their fatherland for its hills, then others loved their own for its splendid appearance, which presented the proud cities visible therein. This picturesque appearance of the cities was not lessened, when in the Renaissance period towers and gables assumed other forms, and the development of the nature of war in the 16 th a and 17 th centuries made intrenchments and bastions necessary around the cities.

We have from the middle ages themselves but a few approximately correct representations of cities. But we have the ideal views, that reproduce for us the character of the views of cities. We refer the reader in particular to Hartman Schedel's Chronicle, [31] that appeared in 1493; but we can also trust v views of cities produced later, their character does not change so rapidly, and the many views of cities, that Mathias M Merian published in the middle and second half of the 17 th century, are however always adapted to transfer us back into the middle ages. Many small cities were yet entirely unchanged; but the views of those cities, which had already experienced substantial alterations, we can still easily regard the latter as removed, the vanished as restored.

Note 31. See Note 28, p. 34.

35. Examples. Reichenweier.

Fig. 7 [29] according to Merian gives the view of the little city of Reichenweier in Alsace, that lies in the plain surrounded by vineyards, at the foot of the hills, that on the right side (2) being the Schwanberg, on which Merian does not

fail to emphasize, the noblest wine of the country grows. We see the regular course of the walls, that on the north side next the hill being only single, but doubled on the others and enclosed by a moat. At the east side stands in the wall the castle marked 1, through which the road leads, here by t the lower gate again out through the upper gate 5, after passing through the marketplace 3. Three churches stand close t together at the north side. To the city walls, moats, towers and gates we shall return later.

Note 29. From Merian, M. Topographia Alsatiae etc. Frankfort-a-M. 1663. p. 43. (The first edition appeared in 1644, a supplement in 1654.

36. Zellenberg.

Not far from Reichenweier lies on a hill the small city of Zellenberg (Fig. 8),[30] high enough to see far over the plain. One views in the distance Colmar A, Breisach B, beyond being the mountains of the Breisgau G, in front at the foot of the city being the villages, Osten C, Hausen D, Mittelweiher E a and Benweier F. The glance shows that the entire importance of the little city lies in the castle, and only comprises the small settlements of citizens belonging thereto, who have located themselves on the sloping plain before its gates. The walls of the small city even form an external enclosure before the castle gate. At the time that the view was taken, they were just at the side where attack was easiest, already partly covered by houses; yet one angle shows a round fortress t tower, and the gate may be recognized, so that just this side was originally very strong.

Note 30. From the same. p. 70.

37. Montbeliard.

Particular interest in many respects is afforded by the view, which Merian gives of the city of Montbeliard, that on t the old border of Germany next Burgundy and likewise located in Alsace, belonged to Wurtemberg for centuries, but in which was found a very mixed population, so that by the effect of the peculiarities of the different races resulted in its streets a picturesque diversity. (Fig. 9).[32] We see that river and hill combined to give the city a strong location, but also a picturesque appearance. The city consists of two parts, the old city and the new city. The first is in the plain, ex-

extending at the foot of the castle E built on a hill, and is surrounded by walls and a partly double moat fed by a brook, [32] that where it reaches the city divides in two parts, that pass through the moats, one line of which separates the old city from the new city, while the other flows around the old city, and these again unite at the great bridge over the little river Alaine, flowing into the same. The bridge over the stream leads into the new city, from which it is recognized, that t the latter is not much later than the old city. However the heights B rising higher than the castle must be fortified, u unless the enemy were given opportunity to erect there a city and dominating castle. The tower, that bears the name of La Groche, is therefore very old, while from 1593 onward the top of the hill beyond was fortified in the new manner, since the tower alone could no longer fulfil its purpose. Our view shows, that the inner city wall itself, for the greatest part a already in the 17 th century was covered by houses, that only a projecting second line had the problem of defense. The round bastion at the angle already belongs to the time directly after the middle ages.

Note 32. From the work mentioned in Note 28, p. 35.

Note 33. In Merion it is desegnated as Rigole. Is this the name? Rigole signifies moat.

Most interest in our view relates to the bridge. At the entrance of the city and at the opposite end it was furnished with drawbridges, that could be raised, in order to break the connection. A square tower, through which one must pass, defended the entrance. On the city side appears to have been a court enclosed by walls, which one must cross to enter the city. [34]

Note 34. From Merion, M. Topographia Helvetiae, Rhaetiae et Valesiae, etc. Frankfort-a-M. 1642. Edition of 1654. p.90.

33. Lucerne.

Likewise especially interesting by its bridges is the plan of the city of Lucerne, two parts of which are represented in Figs. 11 and 12 from a great copper engraving of the end of the 16 th century. Located at the outlet of the Reuss from L Lake Vierwaldstätter, the city extends along the bank on a slight slope, on the eastern and upper part being surrounded by a wall furnished with towers. A part of the city, whose

northwest corner is likewise enclosed by a wall with towers, lies on the opposite side of the lake, there narrow. This wall on the land side of the other portion of the city directly adjoined the wall of the principal side descending from the hill. Next the lake both parts of the city were always o open. This was considered a sufficient obstruction to a hostile surprise. But a bridge was also built across the lake as a direct continuation of the western city wall, and so that the covered way on it could serve as a defensive gallery, while obstructions, indeed chains according to the custom of t the time, between the bridge piers made the entrance of hostile ships and boats impossible into that part of the lake on which the city lay open. At each end of the bridge was found a formal castle; on our illustration certainly both have already laid aside their defensive character. At the southern end of the main side of our city lies the principal church w with two towers, surrounded by monasteries and separately fortified. While the beginning of this fortification formerly joined at the shore of the lake the end tower of the city fortification, the wall made a great curve around the monastery and again extended at the end to the lake, so that even this separate fortress was too open to the lake. From its end extended likewise one of the first mentioned bridges across the lake to the castle, which terminated the latter. As quite particularly characteristic, we therefore have to regard these bridges, that are properly nothing but walls extended through the water, which with the walls of the land side together compose the enclosure of the city.

Note 35. From a copper engraving of Martinus Martini. (16 th century).

If we have just spoken of a formal castle on this bridge, there were only castles for strongly defending this part of the course of the wall outside, but not at all for holding t the city itself subject. Such a castle Lucerne indeed could never have had, which is easily explained by the history of the confederacy, to which Lucerne belonged.

39. Sitten.

Extremely picturesque is the location of the city of Sitten (Sion) in Switzerland (Fig. 10) 34, where the two lofty conical hills made necessary the arrangement of two separate cas-

castles, the city lying at their feet. Very interesting are of works, that from these castles extend down to join the city wall in the plain, partly again forming little castles by themselves, as designated by N, C and D.

Note 34. From Merian, M. Topographia Helvetiae, Rhaetiae et Valesiae, etc. Frankfort-o-M. 1642. Edition of 1654, p. 90.

40. Conclusion.

The history of the development of every city again presents other peculiarities. We cannot possibly examine all cases. T The most important questions, that intrude in the consideration of other cities, must be similar to those shown in our examples. Much will result from the consideration partly left by us to castles; moreover the details will find their treatment in later Chapters. We here close the Chapter on the arrangement and fortification of cities with an invitation to friendly readers to devote thorough attention to all things in this domain, that may appear in their vicinity. If they d devote themselves to this, they will obtain abundant incitement and instruction; they will especially recognize, that in the entire realm of architecture the purpose to be served by a building, that determines the external appearance, that it was not the intention to produce fanciful forms, wherever it was determinative in military architecture, that rather what charms us is the result of the complete fulfilment of the purpose, by which the structures become characteristic and individual.

Chapter 5. The earlier Plans of Castles.

41. Choice of Location.

What was said at the close of the preceding Chapter is met with in a still higher degree in the consideration of the castles, each of which is individual with a special character, that is exclusively determined by the locality and the definite problem, which the castle must fulfil just at the place, where it was erected. It was the first requirement, that the strength and safety of every castle should exclusively determine its plan and arrangement. The comforts of life in the castle could only find consideration so far as incidentally possible without injury to the main purpose, and the chief c comfort was always the feeling of security, which the castle gave to the occupant. This already came in consideration in the choice of the place. If today we see the ruins of a castle romantically enthroned on the apex of a wooded hill, we e experience pleasure in the magnificent location; we study the harmony of the lines, which the castle shows with the character of the region. When we then from above look far over the land, and enjoy the splendid view, we are indeed of the opinion, that the beauty of the place required its selection, and that the castle be placed just there. We perhaps find our own time prosaic and dry, that prefers the plain to the hilltop, and praise the romantic feeling of our ancestors, who felt. "that freedom on the mounteins", and envy them the grandeur, that they had in part. Indeed yes, it is beautiful above; but if we observe what exertion and expense are necessary, that the owner of a modern villa, which he locates in castle form on the mountain, to make for himself and his guests life comfortable there above; if we calculate how much more it has c cost for materials and workmen to be taken up the steep mountain, what it has cost to build the foundation walls, what m massive structures must be erected to obtain but little room; it already shows itself to be a costly pleasure, that the possessor has made for himself. If we now question, whoever passes not merely some months of summer above, but has to enjoy the hard winter time above, as it comes to him, then will he no longer speak to us of pleasure. But we consider now such a mediaeval castle did not at all offer the arrangements for producing that comfort of life, which we now regard as self-

self-evident; if we now indeed reflect, that a castle could or must offer this at all; then shall we easily recognize, t that no vestige of the romantic lies at the basis of these c castle buildings, that rather only hard necessity led to erecting them where they lie, to place them where they meet us. But if we then see, how all come from the purpose, then shall we have a pure enjoyment of the practical sense, and of the mastery with which all is arranged.

In the selection of the place was only determinative the necessity to fortify the location, and so far as a choice was free, it was only concerned to find the place, which offered most protection against attack and the greatest capability f for defense. Men did not seek hills, but went only as high as compelled. If we study the plans of castles, we then find that in the vicinity of many castles are found far "more beautiful"places, they were not so suitable and therefore were not chosen. Also there are only certain ones, that are enthroned on the hills and appear romantic to us; others lie in the plain, just like a modern factory, since they were just as necessary in the midst of the plain as on the mountain.

42. Accessability.

Where possible, men sought to make them concealed and inaccessible; in no case did one endeavor to make the way convenient to them. No high road must be arranged, on which one might drive up with six horses, as to a modern villa with towers in the high mountains. On the contrary one should reach them with as much difficulty as possible; ride there through defiles and over hill crests, the way should be steep and narrow. For whoever would go there by duty or friendship, no road was too difficult; but whoever came with hostile intent s should find it troublesome, and the difficulty should even be increased, and where it was even level, the defenders of the castle already dominated the road by loosened stones and shots, by tearing away certain parts of the road, by obstructions p placed thereon so as to injure and delay as much as possible the approaching enemy.

43. Enclosure, Moats, etc.

But the enemy must also nowhere on his way be out of sight of the defenders; he must be observed in all his movements; but also he should nowhere find an object, behind which he

could easily protect himself from being harassed by the defenders. No building must be in the vicinity, which could afford protection to the approaching assailant; every defile and hollow must be dominated by the castle itself and its defenders. The vicinity of the castle also did not present the romantic view of splendid forests, as they now adorn the ruinsa All m must rather be absolutely naked. No tree must obstruct the view from the castle, from which always watchful eyes spied everywhere, that something suspicious did not show itself, or that an enemy did not approach. No shrub must grow, so that an enemy, even a single man, could conceal himself behind it, and if sometimes in the deepest peace one for a short time o omitted to destroy all vegetation, then must the neglect by quickly rectified, as soon as the castle had to be made fit for defense, when one must fear, that a danger might approach. Only what served as a hindrance was planted and cared for. P Plants that made the rising ground slippery, and caused the enemy to fall, who did not pay attention to them, plants that concealed a pit, briers and thorns in which he might be entangled, were welcome; but even these must have too little height as hedges and bushes, for an enemy to conceal himself behind them. Since the elevated position gave advantages to the fighters, there was always desired at least a small elevation, so that the enemy must climb uphill to the castle, and the defenders could approach him downhill. Where no natural hill presented itself in the plain, a small elevation was artificially thrown up around the castle. There water was preferably e employed as the obstructing means. Where neither brook nor swamp existed, men arranged moats as for cities, filled with water if possible, too deep for armed men to pass through, m moats whose bottoms were soft and muddy to make passage more difficult, but which were not deep enough to permit convenient landing from boats, and in which low reeds and other water plants obstructed navigation.

44. Ground Form.

So far as always suitable, men sought to find such places for castles, at which it was impossible for the enemy to reach a great part of the wall in general; for also was true here for the castle, what had value for the city wall, that the l length of wall to be defended must stand in the utmost favor-

favorable proportion to tne number of defenders. A circle or square was therefore tne most favorable ground form; tne more tne long and narrow rectangular, elliptical or triangular form of castle extended, tne less was tne area, that it offered for tne dwellings of tne defenders in proportion to tne length of tne wall, that must be defended. By preference tnus men c cnose long extended areas only on tne ridges of nills, wnose sides fell so steeply, tnat tney could not be ascended; by preference on tne otner nand men cnose everywnere abrupt rocky precipices, wnere tne assailant could not reacn tne foot of tne wall, so tnat a possibly greater portion of tnis must only be watcned, but did not require to be defended. But wnere tne latter was necessary, since around it was a level surface, tne walls thus being accessible from all sides, a simple calculation snows, tnat a square of 328 ft. side, tnus naving 1312 ft. lengtn of enclosure, afforded 107,584 sq.,ft. area; tnus for one sq. ft. of wall comes 82 sq. ft. of area for nousing the garrison. The same ratio results for a circle 328 ft. diameter, witn a perimeter of 1030 ft. and an area of 84,496 sq. ft. A rectangle 164 × 328 ft. has a perimeter of 984 ft. and an area of only 53,790 sq. ft., tnus for one ft. of wall only 54.6 sq. ft. area; and tne ration is tne more unfavorable, tne narrower tne rectangle; for if we take one 32.8 × 328 ft., tnere results 721.8 ft. perimeter and 10,764 sq. ft. area, t tnus only 14.9 sq. ft. area for one ft. of wall. Similarly unfavorable is tne ratio for a triangular ground form. If we a assume an equilateral triangle witn side of 328 ft, tnere results for 984 ft. perimeter an area of 46,609 sq. ft., tnus for one ft. of wall only 47.3 sq. ft. If we nalve tne triangle, tnere results 7763 ft. perimeter and only 23,316 sq. ft. area, tnus only 30.3 sq. ft. for one ft. of wall; and tnis r ration ever becomes more unfavorable, tne narrower tne triangle. Thus tne square and tne circle form tne only rational ground forms for a castle in tne plain accessible from all s sides. This ground form we also tnen see employed in tne castles of tne 10 tn and 11 tn centuries, wnicn are built of wood and eartn.

45. Mounds (Motas).

Such castles nave remained in England in considerable number,[36] as well as in France, indeed not in tneir original form

but still clearly enough recognizable. They bear in France t the name of "mottes" (mounds of earth), in England are termed "mounds"; the mediaeval Latin expression is "mota". In Germany, where men have indicated in the last decades a considerable number of them, there has been introduced for them the n not entirely correct name of "spitzwall" (pointed wall).

Note 36. See Clark, G. T. Mediaeval Military Architecture in England. London. 1884.

Such mounds with flat tops have an upper diameter of 32.8 to 98.4 ft. with a height of 9.8 to 42.7 ft. The earth was taken from a ditch excavated around them, which was correspondingly wide and deep. Where a natural hill was found, that only required to be dressed off, and it was naturally used by preference.

The development of these so-called mounds (spitzwälle) follows from the old walled castles. But here we need not go back into the earliest period; we find starting points quite t tolerably late.

Among the early mediaeval earth castles of Germany in any case is that arranged in the older manner, the Pipin's castle 37 belonging about to the 9 th century and near Lehr in the county of Stade, which is one of the most interesting. In circular form, it occupies the southwest part of an elevation s surrounded by a moor and swampy meadows, washed by a brook at the south. It has a diameter of about 131 ft. and is enclosed by a wall of earth, which at the south has a height of 16.4 ft. and one of 32.8 ft. at the north. About 33 ft. outside t this wall it is surrounded by a second lower one, which is o only open at the south, where the brook afforded sufficient protection. The entrance lies at the north side, protected by a hill lying outside. At the northeast adjoins a doubled outwork. About 984 ft. eastward lies the so-called heathen city, an oval enclosing wall of 263 × 131 ft. diameter, that rises about 6.5 ft. above the ground. It is surrounded by swamps, between which is inserted a second wall at the north.

Note 37. See Zeits. der Hist. Verein für Niedersachsen. 1870. Plan on Plate 8.

This plan, that belongs to the last period of those earlier walled castles, is now opposed by the so-called "pointed walls", that certainly in part are not very pointed or high. We refer

to the Drusen or Caloren hill [38] located about 1 1/4 miles n northwest of the well known Roman camp of Saalburg near Hamburg-o-H., a partly circular artificial hill, whose level top is 42.6 ft. diameter and only 6.5 ft. higher than the enclosing ditch 43 to 49 ft. broad, whose centre slope is somewhat filled up, so that the water of a little brook can be retained within it.

See Cohausen. Die Wallburgen, Landwehren und alten Schanzen des Regierungsbezirkes Wiesbaden. Ann. d. Ver. f. nassauische Altertumskunde u. Geschichtsforschung. 1879. p.343.

The Gewahne hill [39] near Schwalheim, 0.9 mile north of Friedberg, shows innermost a hill 13 ft. high of 102 ft. diameter, which is surrounded by a ring 43 ft. wide and only raised about 1.6 ft. above the external ground, that is again surrounded by a ditch 33 ft. wide, into which water can be introduced. The entire plan is still enclosed by a ring wall, that has a diameter of 394 ft., but is only about 2.5 ft. high.

Note 39. See the same.

If we further name the Altburg near the Haselneck [40] 6.9 miles northwest of Friedberg on the old Butzbach road, where on an elevated heath gently sloping eastward is found a square heap 52.5 ft. side without a wall, that is surrounded by a d ditch 39.4 ft. wide and now 3 to 13 ft. deep, partly made a swamp by flow of water. If we reconstruct the original section according to the existing dimensions, so that the excavation of the ditch formed the heaped middle hill, then this would already have a considerable height of about 33 ft. above the bottom of the ditch.

Note 40. See the same.

Characteristic of the seats of the nobles of the 10 th to 12 th centuries is the castle of Alt-Sternberg (Westphalia): [41] the area has a diameter of about 131 ft., is surrounded by a moat, has a horseshoe-shaped outwork with ditch and several works, but nowhere exhibits a vestige of masonry.

Note 41. Köhler cites Holzermann, L. Lokaluntersuchungen, that relate to the wars of the Romans and Franks, as well as the mode of fortification of Germans, Saxons and of the late middle ages. Münster. 1878.

These earthworks preserved everywhere in Germany, whose number is not small, were now finished with wood, whose arrange-

arrangement can easily be supplied in spirit according to the statements of the writers of that time: for such earth castles were still erected until in the 12 th century, and were n not out of use even in the 13 th. A description of castle Merchem near Dixmuyden (Flanders) is preserved to us in the sketch of the life of the blessed bishop Johannes of Terouenne,[42] who died in 1130, that Johann de Collemedio left. The bishop there visited about the year 1115 the castle standing beside the church, that the owner had built "many years before according to the custom of the country", and that was very high. It was indicated as the custom of the richer and more prominent of this region, "who particularly engaged in war, that to be secure from their enemies, to conquer their country associates, and to subjugate their inferiors", to raise a wall of earth and surround it by a deep and wide ditch. The top of t the wall [43] they covered by a close fence of split logs, that was strengthened by towers arranged in a circle. In the middle of the fence was built a house or castle, [44] from which all could be overlooked. Access was only possible by a bridge, that rose on 2 or 3 piers from the outer edge of the ditch n high above the moat to the height of the wall and to the gate.

Note 42. See Bollandus, J. Acta Sanctorum. Jan. Vol. 2, p. 799. -- Reprinted in Clark. Vol. 1. p. 33.

Note 43. In consequence of an erroneous translation, a false statement is also circulated, that this palisade fence was p placed at the base of the wall.

Note 44. Domum vel arcem. -. Köhler translates; blockhouse or stone tower.

We owe this description to the fact, that the bridge at Merchem, that rose 30 ft. above the bottom of the ditch, fell w when a great multitude of men were on it on the occasion of the presence of the bishop thereon.

46. Later Earth Castles.

However perishable were the separate buildings, the mode of construction yet lasted long. In such manner were still erected the castles of the Teutonic order in Prussia until the middle of the 14 th century, although the order had already commenced there in the 13 th century to build stone castles.

These Prussian earth castles consist of a square raised about 6.5 ft. above the ground, with sides of about 33 ft., for

the construction of which natural hills were utilized, where existing, their tops being removed to extend the terrace, about their edges being made a small earth wall. To this nucleus of the fortification adjoined other low lines of walls, that either rise separated by ditches and entirely surrounded the former, or were only attached at one side, according as the ground required. These earthworks are mostly enclosed by an abattis placed before them. (Felled trees, etc.).

As confirming the former use of wood, where a castle was burned, there are occasionally found charcoal remains of the burnt palisade fence. Thus at the Wallburg at Darden (Circle of Fischhausen) along the entire upper edge.[45]

Note 45. Köhler cites Baron von Boenigk. Ueber Ostpreussische Burgwälle in ihren einzelnen Theilen. Königsburg. 1880. -- T This is evidently a separate impression of the Essay with the same title in Reports of Sittings of Soc. of Antiq. of Prussia. 1879 - 1880. p. 57 et seq.

47. Stone Castles.

Our readers in the circles of architects would doubtless be little grateful to us, should we treat these earth castles m more fully, however interesting may also be this theme. We t therefore refer to those colleagues, who have particularly interested themselves in them, to the sources cited and Köhler's treatment of the objects, that we must now leave, though these earthworks still form the basis of monumental mediaeval castle architecture. The German mode of building in wood gave place first under the influence of the Roman among these German races, who were attracted to the south. Goths and Lombards n had not merely learned stone construction in Italy, but also employed it in a comprehensive way, just as the Visigoths in southern France and Spain. In northern France and on both banks of the Rhine the Franks had likewise joined their stone construction to the work of the Romans. But in the remainder of Germany it only slowly became at home, and only under the influence of the Church, thus being connected with Italy. Meanwhile in the course of the 10 th century in Saxony many stone churches originated; in the 11 th century stone construction for churches became the rule everywhere, and also gradually found admission in secular architecture. We know that w where in later time castles of the old stone construction were

yet preserved, or where men employed palisades in general, t the necessity of frequent removal made itself felt as a disadvantage, and thus men here and there became tired of wood construction, and therefore came to place gradually stone walls and towers instead of rows of palisades and wooden towers, w which were less perishable not only in peace, but also resisted fire in war, by which the enemy sought to destroy the fortifications. How and when this change was completed can scarcely be proved; in any case it occurred but very slowly and gradually, in France [46] earlier than in Germany, here in any case at the same time as the introduction of stone fortifications also in city architecture, and thus in fact may a castle show considerable remains of walls of the 11 th century. Were there indeed the great contest between royal and feudal supremacy, that gave castles a different importance, and the master of the castle, who was now accustomed to regard his castle as his own property, that hitherto he must consider a fief, this may have caused him to devote more attention to it, since also he could no longer count absolutely on combination with his neighbors, but each one must also protect himself a against them, fear sudden surprises, and have to see after g greater strength.

Note 46. A. de Coumont mentions in "Abecedaire ou rudimente d"archaeologie" as such a stone structure of the year 1047 t the castle of Du Plessis Grimoult (1 st edition, p. 331 et seq. -- In Germany we have near Vibbel on the island of Widdo a hill 18 ft. high and 85 ft. diameter, that is surrounded by a terrace 49 ft. wide and a ditch 59 ft. broad. The "pointed wall" itself is enclosed by a wall with two towers, within w which stand ruins of different buildings, and also many later castles show in their plans so fully the character of the so-called pointed walls, that we must indeed assume, that they are rebuilt mounds (motos).

If we also thus find in a series of castles parts, that belong to the 11 th century, it must still be hard to designate entire castles, that in general appearance are characteristic of the 11 th century, since only for few the monumental rebuilding or construction in the 11 th century must have been e entirely completed, without that where this was perhaps the case, changed conditions in later times had required again a

rebuilding or a substantial extension.

48. Oldest Stone Castles of Germany; Mounds near Rüdesheim. The character of the oldest stone castles of Germany is best followed at those two castles, that in Rüdesheim stand beside each other at the lower end of the city, but certainly also not remaining in their original form. [47] These are the Oberburg and the Niederburg, whose plans (at the scale of 1:12,000) are given in Fig. 13, [48] where we have placed these two plans approximately beside each other, as the castles actually stand. We believe that we do not err in assuming, that at the time when both castles were erected, the bed of the Rhine was even wider than today, so that the Niederburg, that today stands entirely dry, was still surrounded, and therefore this is to be regarded as a water castle, which men could only approach in boats, unless a bridge led from the land to the entrance, which in any case was so constructed, that in case of attack a part of it could easily be broken away.

Note 47. Drawings and description by A. von Cohousen in -- Cent. d. Bauw. 1886. p. 303, 310 -- also in ; Ann. d. Ver. f. nass. Alt. u. Gesch. Vol. 20. p. 11 et seq.

Note 48. From von Cohousen.

The Niederburg had no moat, since it stood in the water. It is not an absolutely square plan. Yet it may be recognized, that formerly only one strong wall formed the enclosure, and a tower stood in the northwest angle beside the entrance. Now the structure is only preserved in a changed form, that we m might ascribe to the end of the 12 th century, and that will be fully treated later. Therefore it is then very difficult to prove what originally existed. It is determinative for us, that without a principal tower a castle of the 11 th century in general is not at all conceivable, and so we believe it necessary to assume, that the middle tower, which still exists, already belongs to the arrangement of the 11 th century, as von Gohausen opines, even if it be somewhat later in its present appearance. When on the other hand the last named author assumes, that in the now vacant southeast angle a similar tower stood, like that yet standing in the northwest corner, we see no compulsory reason for this, since also the two other angles have no towers, and perhaps the existing one, t that protects the entrance, must be regarded as alone existing.

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The shore of the Rhine is no case remaining the same always. If we have also drawn a straight line in our plan on the shore of the Rhine, then this is to be regarded as very changeable.

But in no case did the Rhine extend to the Oberburg; this rather lay entirely on firm dry ground, as proved by the ditch extended ar-int it. Of this Oberburg indeed nothing more above ground is to be seen, excepting the tower against which is o built a modern villa; but underground is still preserved the entire ditch, that was recently entirely open, but was vaulted ove some decades since, and serves as a storage cellar for splendid Rhine wine. Also in the Museum at Wiesbaden exists a well made model in the 17 th century, that in spite of many later buildings visible thereon, still exhibits the ancient appearance. This Oberburg is a true mound. The enclosing wall is approximately a square of about 98 ft. side, encloses a t terrace elevated somewhat above the external surface, which indeed must have been raised originally 5 to 6.5 ft.; instead of an earth wall, a masonry wall surrounds this terrace. The enclosing moat has a varying averaging 33 ft. The bridge was at the east side. Not quite at the middle of the terrace but rather displaced toward the west stands the tower. Directly attached to this on three sides were vaulted structures, that indeed bore a platform. A wall before it also inclosed in inner court. This castle must have appeared as an attempt at r restoration shows it in Fig. 14.

49. Attempts at Restoration.

We have a series of attempts at restoration to be given. I It is therefore permissible to say some things for this first one, which also apply to all others. All these attempts, whether proceeding from the author of these lines or from others, are hypotheses, and the honored readers will accept them as such; they will carefully distinguish between such hypotheses and drawings of the existing constructions. The author never neglects to state what source he has used, where the drawings of the existing construction are to be found, according to w which he has worked, and for whoever wishes to decide on what he has given there, I do not omit to compare these original sources. Where my own differing drawings are the basis, this will always be noted. Men may have a different opinion of the importance and worth of such attempts at restoration. Men have

actually reproached the author of the"Dictionnaire raisonnee de l'architecture francaise", that he has allowed too much p play to his imagination. Certainly with injustice; for nowhere has he given his "fancies" as drawings of the existing condition. It is then the affair of whoever will use his work to investigate, how far he must go therein, and how on the ground of better sources or even different opinions wishes to establish other hypotheses, will not be restricted by Viollet-le-Duc's work therein. He has utilized besides drawings of the mutilated condition of everything, and this has also been attempted by the author of these lines, what on other contemporary structures serving like purposes has been preserved in better condition, from which it must then be assumed, that w was the rule at that time; for even if each structure is also an individual, then it still belongs to a class and family, that have their common peculiarities, just as well as the classes and families of the animal kingdom, and if we know that certain insects have six legs, we must assume that also those originally had six legs, that we find dried and robbed of a part of their legs with but three still in the cases of a collection of natural objects. We shall have no particular regard for the criticism, which still requires from us the proof, that these existing examples did not formerly have but three legs in general. Just so is it for the buildings, when we must depend on better preserved examples, for the assertion, t that there were originally six, just like the natural historian. But whoever now, because once the insects of his case n has yet only six legs, is satisfied with this fact, and will not trouble himself further about it, how they were originally, if he must appear as instructing, such as the problem of the author, will scarcely give his readers a correct idea of the insect world, and even so it is necessary, if one will r rightly estimate the importance of the existing remains; and will have a proper opinion of the architecture of the earlier periods, to add to each structure, what is wanting today. If an error occurs, another may correct it.

50. Castle Towers, Platforms, Roofs.

As especially characteristic we find at the Oberburg at Rüdesheim the form of the tower. 49 It may originally have certainly been somewhat lower. The diminution (batter) of the ex-

exterior is not found on later structures; it must therefore in this manner belong to the earlier time. The tower of the Niederburg must have been similar. As at all similar towers, no gate in the lower story led into it; rather was the doorway so high, that one could only reach it by means of a ladder or by a lowered rope. But the entrance, that we have drawn in Fig. 14, even if also old, is not the original one, that was found rather on the opposite side and still more elevated. C Characteristic is the lack of windows, by which safety was increased, but comfortable residence was directly prevented. The feeling of safety was the only comfort, that such a structure could grant the inmates; for in fact with the means of that time, it was scarcely possible to storm such a castle w without great sacrifices. We indeed have no evidence, that d drawbridges were already in use then. We cannot however think that the drawbridge leading to the entrance was permanent; if not constructed in the manner of the later drawbridges, a portion must have been furnished in a different way with a handy construction, that made possible a temporary interruption. If this break were made and perhaps the entire bridge was removed, then it was not otherwise possible to reach the wall, than by filling a portion of the ditch, which must be done under the shots of the defenders standing on the walls. If in s spite of there activity such a causeway were built, the attempt might be made to destroy it with crowbars, to undermine it, or ladders could be set against it to ascend it, or wooden towers higher than the wall could then be shoved against it, from which men could descend on the walls, and could hand to hand with the defenders. If the walls had towers, each of them formed a section and a separate defensive work, that must be stormed and taken, before the enemy was in possession of the wall. If he had reached the latter, there stood before him a second wall, that must likewise be taken, until he found himself before the tower, whose height made it difficult to ascend, whose thick walls were hard to destroy or to overthrow. If he had reached the interior of it, he held only one story in it. Each of them, at most accessible by a narrow stairway in the wall, as in our case, or as generally accessible by a hole in the floor and a ladder, must be separately t taken, and thus it required no little time and bravery oppos-

opposed to even a small but decided garrison, to actually conquer such a castle. Generally men must be satisfied to besiege it so long, that the garrison was compelled by hunger or other compulsion to surrender. Men indeed employed machines for casting against the walls; but these had neither the unerring aim nor the force of our modern cannon. The garrison, t that placed such on the platforms of the castle, could thereby far better reach the unprotected assailants and their temporary works, than the latter could do against the massive castle. Therefore such platforms always belonged to the defensive apparatus of every castle. Particularly all towers had on top their terraces, and if we conceive any castle in a g good condition of defense, we must imagine such platforms surrounded by battlements on all parts, that could and must be defended, on which the defenders could move freely, and on w which also stood the casting machines. But these platforms w were hard to maintain watertight, and where the materials were not absolutely excellent, they were greatly exposed to injury by weather. Therefore everywhere that cilamte permitted, roofs were placed over them, which could be easily removed if necessity required.

Note 49. We intentionally avoid the expression "belfry", w which has recently been employed for such towers without justification. (See chap. 9).

The usual appearance of a castle therefore shows us everywhere in the North those pointed roofs, which still please us on well preserved castles, and which alone have ensured their permanent preservation, and can ensure it farther. Therefore also but exceptionally in certain of the following attempts at restoration of German castles, we have omitted the roofs, although these do not always entirely belong to the true appearance.

But such a mound like the Oberburg was originally also the Niederburg, and the fact that here none of them stand directly together, sufficiently shows how great the number of such little castles must have been originally, that with their small garrisons if combined, could resist but little. These mounds formed in a sense the last offshoots of feudalism. In t them sat the separate vassal, who with few horses and troopers had to resist an army. The greater families, the counts, found

greater castles necessary, and where a formal court should be held, as in the castles of the duke, there were necessary other arrangements, than such a mount afforded. Certainly in o our restoration, we have drawn only the monumental parts of the Oberburg. The model of the 17 th century shows nearly the entire empty area as occupied by wooden structures; particularly the space between the two walls of the north and east s sides was roofed. Since it had a width of 20 and 23 ft., then already in the 11 th century may separate wooden structures have stood there, in which animals and men found shelter, for which as separate dwellings their room could not be afforded. Likewise in the Niederburg indeed scarcely the entire court was free, but wooden structures must have occupied a portion of it.

51. Palace at Egisheim.

A very remarkable monumental mound is the so-called palace at Egisheim in upper Alsace (Fig. 15).[50] A high octagonal a ashlar wall with each side 42.7 ft. long stands today to a n height of 26 to 30 ft.; the ditch is filled, that surrounded it; likewise some decades since the octagonal tower was removed, which stood exactly at the middle of the plan. The ashlar work with bosses on the enclosing wall in general indicates the 12 th century; meanwhile one can neither state, which is the first example of ashlars with bosses, nor decide that this mode of building was limited to the century mentioned. But we ourselves assume, that we have here before us one of the earliest examples of ashlar construction with bosses, and that it falls in the 11 th century, so that in the plan of t this low castle we can still recognize only a reminiscence of an older design. Instead of this stone castle formerly stood a wall with palisades and wooden blockhouse in the middle, that the master,or perhaps more correctly expressed, the commander of the little castle occupied, while in the inner court might have been erected barracks for the garrison and their horses. When the rebuilding followed is thus not very important. As the tower appeared in place of the blockhouses, a and instead of the earth wall the high masonry wall, attached to the latter wooden buildings may have stood inside it in a circle, so that only a narrow strip of court remained free about the tower.

Note 50. See Koeher, J. Die Burgen in Elsass-Lothringen. H Heft 2. p. 6, Plate 3. Strasburg. 1886.

Note 51. See the same. Plate 3.

52. Asnlars with Bosses.

If we consider tne mode of figntine of tnose days, it finally was an encounter of man against man. Tnis also occurred in a siege, that must end in a storm, in regard to tne combat. The latter could not be made impossible by tne fortification; tnerefore even for the defenders tne conditions were to be m made as favoraole as possible, as unfavorable for the assailants as they could be made. There was now a wall witn a slope of about 45°, even if still overgrown by grass or broom, an obstruction to tne assailants not to be underestimated, who nad to climb it to find at tne top tneir opponents benind a strong breastwork of palisades on firm ground, witn which tney must fignt nand to nand. On tne contrary if a wall of t tne same neignt nad opposed them, it was only a matter of oringiug sufficiently long ladders and of properly fixing tnem, so as to ascend tne wall on tnem, and tne compat sougnt could occur on its top. It was tnerefore necessary to do all, tnat could make more difficult tne raising of tne ladders. For tnis tne asnlars witn bosses served finely, for tney prevented tne ladders from being slid up on tne wall, and men nave desired so much tne more to derive tneir origin on tnis ground, since tney occur exclusively in military architecture. They also give to tne appearance of tne structures a certain force, tnat decidedly corresponds to tne cnaracter of military architecture.

The origin nowever must nave a purely tecnnical ground. In tne transition from eartn to stone construction, it was necessary to employ skilled artisans, masons and stonecutters, instead of tne simple serfs, wno could move tne eartn, and tneir labor must be repaid. That was a more expensive matter, tnat must be reduced as much as possible. Especially asnlar work, which certainly resisted tne battering ram better and made u undermining more difficult, tnan tne rubble of split stones, required tolerably large blocks; tnen must it be regarded as an advantageous saving to cut only tne edges of tne stones, tne middle parts being left as tney came from tne quarry, tnereby omitting tne not absolutely necessary work of tne stone-

stonecutter. If the consideration od storming ladders were d determinative, then would men have not employed ashlars with bossed in places where a ladder could never be placed.

53. Castle Arques near Dieppe.

In the further programme of our examination we now meet with castles of all sizes. Originally the mode of construction for these larger ones was not different from that of the mounds. Viollet-le-Duc presents to us in the Castle of Arques near Dieppe, [52], that he attributes to the 11 th century, with which we willingly agree in reference to the entire plan. The separate structures, as reproduced, may in great part fall in the 12 th century. The plan in Fig. 16 [53] is drawn at the same scale as the Rüdesheim mounds (1 : 2000), like all our general plans of castles, so that thus the relative dimensions at once appear to the eye. But the mode of construction of the earth castles before described here entirely meets us, a applied to a great plan.

Note 52. See Viollet-le-Duc. Vol. 4. p. 69 et seq. -- Also Clark. Vol. 1. p. 188 et seq.

Note 53. From Viollet-le-Duc. Vol. 3. p. 70, 72, 75.

At the foot of a mountain slope S, from which it is however separated by an excavation, which seems to us too mighty to be able to regard it as artificial, as for other castles, there appears an oblong terrace sloping down from south to north, that is enclosed by a deep ditch and a high wall D E F.G N outside it. The edge of the terrace itself was indeed later surrounded by a high wall, interrupted by a number of towers. Since the top of the hill does not consist of loose earth, b but of strong rock, the ditch O is in great part cut in the rock. Inside the ditch a passage also cut in the rock extends around the entire castle. The section in Fig. 17 [53] makes this clear. At the foot of the castle extends a small area from a brook Q at the foot of the castle rock up to the wall, enclosed by a wall G H I K L M N. Beyond the brook are wet meadows R. A road leads from southeast to northwest through this area; north of it intersects a series of roads, of which the road P P leading through the ditch is dominated as completely by the castle wall, as that passing through the places H L. The entrance to the castle is at Bbefore which is an outwork C, [54] from which a bridge led to the top of the wall at D, f

from which the road down the hill to the tower M led beyond to the road D. The principal tower A was developed into a formal building, that in its interior afforded a considerable space for living, since a man of the standing, such as the possessor of such a castle had, in spite of all moderation, had greater needs than the occupant of one of the mounds of Rüdesheim. What is to be particularly considered at this castle is the fact, that it still had a second entrance F at the opposite side, that only led to the ravine on the south side of the castle. This may have been a way for flight or for a sortie; for the side from which naturally the attack proper was to be expected was always here the north side.

Note 54. The same first belongs to the 15 th century. Viollet-le-Duc is of opinion, that the wall was originally simply oval, that thus it did not already have a predecessor in the 11 th and 12 th centuries. From thence is also taken the perspective view (Fig. 18).

The terrace itself was divided into two parts by a transverse wall, so that if an entrance at B was forced by the enemy, they could not reach wet the tower A, the chief part of the castle. The platform, particularly the low part near B, now contained a series of structures built of wood, that were placed here and there, and in which men, animals and supplies c could find shelter.

54. Donjon, Keep, Hall.

Some very interesting structures of this castle, especially the principal tower, will be mentioned later. Such a main tower (donjon) formed the most important part in the 11 th century in the Norman castles. Viollet-le-Duc attributes the towers of Champigny and also of Falaise to the 11 th century, that according to his assumption were only surrounded by light earthworks, and first received stronger external fortifications in the 14 th and 15 th centuries. Thus he also expresses the conjecture, that the numerous castles, that the Normans under William the Conqueror (1066 - 1087) erected in England, were just strong masonry towers (keeps), that were enclosed by a light earthwork. But it is characteristic of all the important magnitudes of the keep, that are to be regarded as strong residences of such lords, that besides strength also desired some comfort, and before all sufficient room for them-

themselves and their followers in their strong houses. Already then these castles in part bore the appellation of "hall". The tower must then include a hall within it as the chief room. In the German castles we find this hall developed in the palace, the tower therefore with few exceptions lacking all comfort. The most interesting and most extensive of these keeps in any case is the nucleus of the Tower at London, the White Tower.[55] Meanwhile besides the rectangular Norman keep developed from the French donjon, there also remains the round tower, also in the course of time developed into mighty structures like the rectangular. (Shell keep). We shall have to r return to both kinds later in the consideration of the strong house.

Note 55. See Clark. Vol. 2. p. 207 et seq.

We have similar castles in Germany, surrounded by wall and ditch on the sides of hills. The most interesting of these is indeed the Salzburg[56] near Neustadt on the Frankish Saale, that already existed in the Carlovingian period, and whose p plan may belong to the 11 th century, so far as it is still preserved. Certainly the greatest portion of what exists on the buildings also belongs to the 12 th and 13 th centuries; but the general plan, especially the moat and the enclosing wall on the south and west sides, doubtless belong to the 11 th century. We give in Fig. 20 the plan and in Fig. 19[57] the section at the scale of 1 : 2000.

Note 56. See Krieg von Hochfelden (Anz. f. Kunde der deut. Vorz. 1837. p. 89 et seq) and his "Gesch. d. Milit." etc. -- Additions to the ground plan are according to the drawings of the author.

Note 57. From the same.

We also have here the elevated terrace and the ditch enclosed by a wall. As everywhere, the excavated material was also employed here to level the terrace and construct the earthen wall, yet wall and ditch were not of dimensions as at the castle of Arques; yet still they were large enough to form an obstruction to the approach to the wall. The plan offers much of interest. First we can well assume, that at first the wall and ditch were constructed around it. There it remains noteworthy, that the entire ridge of the hill sloping off southward is not included in the defense, but remains left outside it,

although an assailant might reach it without great difficulty, and thus could make a strong stand directly before the wall. Thus we have to conceive wooden outworks projecting here. On the west side [58] where wall and ditch are well preserved, one sees that the latter is cut from the rock with not too great regularity, doubtless with the intention to make passage in the ditch as difficult as possible, so that the enemy, that had taken it, could not move freely therein and would find d difficulties in his operations, while he was exposed to shots coming from the wall. Protected by wall and ditch, one might easily undertake to replace the inner second earthen wall, t that originally enclosed the terrace, in parts by a masonry wall; on the north and south sides this inner earth wall has remained, and vestiges of it may be recognized today, since the masonry wall with the towers -, B, C and D are set so far back, as to form a formal enclosed scape before them. [59] This wall extending around with towers is executed in split stone, such as the site afforded. Only the tower A is built of ashlars with bosses and certainly belongs to the 12 th century. Although now windows, which show the expressed style of the 12 th century, occur at places at which structures are directly attached to the enclosing wall, and although buildings m manifestly belonging to the 13 th century and still later times exist in the castle, that are correctly executed in the same split stone masonry, yet we cannot believe, that already at the building of the wall itself these windows were planned, which under all circumstances lessened the resistance; we believe rather, that the wall already existed there previously, consequently must have originated in the 11 th century, and that first at the addition of the buildings in the 12 th century the windows were opened. The entrance was indeed found at A at all times, at the highest point, that certainly does not indicate much, since the fall toward N is not important. The castle is separated into three divisions; the foremost w was separated from the second by a wall, that ran from tower E to chapel K [60] past the first principal tower F, beside which was found the entrance to the second, and from thence doubtless to the tower H. A series of buildings with their own courts mostly originated in the 12 th century, and there was little regard paid to the comfort of individuals or to the s

strength of the whole. In the 12 th century the fortress belonged to the bishop of Würzburg, who may have placed there a number of vassals, who then erected their comfortable seats in the great castle, thus the buildings indicated near tower C and those marked Q, T. V. In the second court are found the buildings L, M, R, S. The structure marked L could be regarded as the chapel, if it were orientated. Popular tradition d designates it as the mint, which it certainly was still less. In any case it is one of the most charming secular structures of the 13 th century, of which we have to speak later. The t third court is found on the lowest ridge of the hill. A second principal tower defended the entrance lying next to it. In t this third court was found the well P, at N again being a house of the 12 th century consisting of two parts. At O is a later house, that dates from the 16 th century, the sole still habitable monumental building.

Note 58. At the south side, where in our century vineyards have been planted, the earth wall has been removed and the a ditch made wider, so that the vineyards extend directly to t the masonry wall.

Note 59. On the meaning and origin of the word "zwinger" (enclosure), see Chapter 10.

Note 60. This is new, yet originally a similar one stood about on this place.

Of quite particular interest are the remains of the tower H; although it is torn down almost to the internal ground of the castle, it may yet be recognized, that in it was found t the connection with the castle ditch. On the southern side the wall no longer follows the course it had before the north side from H; but the entire narrow side of the tower is exposed. At this narrow side there is now in the interior of the tower a pit about 10 ft. long and half as wide, that has a d door at bottom, which leads out of the castle to the outer foot of the wall. A stairway or its like does not exist; rather ascent and descent in the interior of the tower through this pit must have been made by means of a windlass. On our section in Fig. 19 is visible the little door of the tower.

56. Castle Dankwarderode.

Larger than the Salzburg is the plan of Dankwarderode, the castle of the Saxon duke,[61] that gave the city of Brunswick

its origin. Located on an island of the Oker, whose course p passes through swampy meadows, it was protected by swamps and water, and still bore a fortification of wood and earth, until weel at the close of the 11 th century a rebuilding in stone was undertaken. Winter has determined with great care the course of the fortifications, as well as the location of the different towers, so that we can base our plan in Fig. 21 [62] on his studies.

Note 61. See Winter, L. Die Burg Dankwarderode zu Braunschweig. Results of the investigations in architectural history instituted at the order of the city magistrates . Brunswick. 1883.

Note 62. From the same, Plate 5, etc.

We willingly assume with Winter, that Dankwarderode under Henry I received a fortification, that was entirely constructed of wood and earth after the custom of the time. It was b burned to the ground about 1090. But already between 1022 and 1037 the monastery church in this castle was erected as a stone structure, so that according to Winter's assumption, it was not destroyed by the fire in 1090 but remained until the rebuilding by Henry the Lion. On the manner in which after 1 1090 the rebuilding was executed, all possible starting points are lacking, and still we believe that Winter does injustice to his countrymen, when he asserts, that the condition of civilization in Saxony in the 11 th and 12 th centuries had not risen to the height, that a stone construction of the castle is conceivable before Henry the Lion. We merely recall Gaston! We rather believe, that the state of civilization of Saxony in the 11 th century was the highest conceivable for Germany, and that only perhaps the Rhine provinces could compete with Saxony, but not Swabia, Franconia and Bavaria. We therefore also do not doubt, that the castle (castrum) Winter mentions, dates before Henry the Lion and belongs to the close of the 11 th century, thus originating after the fire of 1090; indeed we go a step farther and assert, that the buildings of Henry the Lion robbed the east side of the castle of its defensibility, for whoever considers the plan must at once recognize that the palace was not defensible, that it also opened a gap in the system of defense. Whoever placed the palace defenseless in the manner in which it now stands, could entirely

spare himself the trouble to protect the remaining part of t the island in the Oker by defensive works; no enemy could ever direct his assault elsewhere, than against the palace lacking all protection, the drawing of which in Winter's work should be examined. We regard the castle (castrum), under which designation it is mentioned in 1134 in a document of the emperor Lothaire, as a work of the close of the 11 th century, and so we also readily understand, that emperor Conrad in 1151 did not think of a siege of the castle, but before Henry the Lion left the country without fighting.

However little positive we know of the castle, yet Winter's plan, as Fig. 21 shows, affords opportunity for many instructive discussions. First we place before ourselves the question, whether the Oker island had its shape at that time naturally. When we now see that the Oker entirely flows through s swampy lowlands, yet at this place the western arm presses to the edge of the swampy land, we must indeed conclude, that t this was not the original course, that rather a removal must have occurred there, and that thus the island was artificially enlarged. This may have already occurred at the first plan, and the somewhat elevated portion may indicate the original island. Wherefore it now comes to present the second question, is the enclosing wall with the towers not directly on the arm of the Oker? Certainly not. This area must have been included in the defense. Since no vestige of a wall is found, there w was indeed an earth wall, similarly as before the northeast side of the Salzburg. We have introduced it as designated by B in the plan. It is an arrangement, such as men later termed an enclosure ("Zwinger"). Here as at the Salzburg, where the arrangement is not on the side of the slope, but is only found opposite the hill terrance, the earth wall is indeed a part of the older fortification, that men must indeed not destroy before the new masonry wall was completed. The latter must thus be built at such a distance behind the earth wall, that this should not merely remain untouched, but could also be defended without hesitation, while it was built behind this. But after the new wall stood, the earth wall must be retained, until it could likewise be replaced by a front wall; for just this one could not remain independent. Since the undermining and the ascent of the walls formed an essential part of the

siege works, then must in general the direct approach to the wall be obstructed everywhere, for which such an earth wall with a row of palisades was the best means.

To the notable peculiarities of the plan also belongs, that on the other hand the tower A, which contained the entrance to the castle, projected into the water. It is also larger than the other towers of the wall, perhaps older, and since we must indeed also establish these hypotheses, was already erected as a strengthening point of the wall, but was then retained for the later fortification. On the east side was f formerly found a row of towers, of which a larger tower C as well as the three towers D and a tower E are proved by Winter's studies.

We have before stated, that the palace of Henry the Lion m made a gap in the system of defense. But similarly disturbing for the defense must also have been the monastery, that he connected with the new cathedral. The cloister around the court L, especially in extent from west to east, cannot have been substantially smaller than that last existing, visible in Fig. 21. But now the cloisters were nothing more than passages leading to rooms extended around them, and the cloister had no purpose at all, unless at least as we have indicated, a wing building was found on the east side between it and the tower E, which at least made the defense more difficult, since it was in the possession of the prior. But doubtless there was such a wing K also on the south side, inserted between the two wall towers and the cloister, which we have omitted to i indicate in our plan. But only incidentally may it be noted, that the tower E had an entrance, that connected the monastery with the part of the city lying opposite, thus also making the defense of the castle more difficult. We certainly need not assume, that this was already arranged in the time of Henry the Lion.

Winter indicates a series of buildings not monumentally executed, that stood on different places of the castle. A principal tower, as such must have existed as the nucleus of the castle, as the last place of refuge and of defense, so long as the castle was defensible; it Winter could not prove, as he expressly states. In any case, it stood on the upper terrace, that indeed has its own wall, but at least bore a palisade f

fence, perhaps at I, where the bronze lion stands, perhaps in a place now occupied by the cathedral, and in any case it must already have been displaced by the buildings of Henry the Lion.

It does not pertain to the least interesting considerations, that we can add to Winter's careful studies, that it was just Henry the Lion, after he had come to rest after hard combats, who did not newly fortify his castle Dankwarderode, but partially removed the fortifications, in order to change it into a comfortable and peaceful seat of a prince.

This may not have been the first similar case. The examination of the imperial house at Goslar, whose surroundings certainly must exclude for us such information on the ground, t that it shows us the plan, how it no longer happens, that it is to be regarded as the palace of a strong castle.

57. The Wartburg.

Among all German castles, scarcely any other has found greater interest among all classes of the people that the Wartburg.[63] Likewise for the study of the development of castle a architecture it presents much interest. (Fig. 22).[64]

Note 63. See Ritgen, H. von. Führer auf der Wartburg. 1 st edition. Leipzig. 1859.

Note 64. The same. p. 73.

About the middle of the 11 th century, planned by Louis the Vaulter, landgrave of Thuringia, its enclosing wall follows exactly the form of the top of the rock, that falls from north to south. At the northern point this is separated from the adjacent hill crest by an artificial cut. All sides of the hill on whose terrace lies the Wartburg, can be considered as not to be climbed, so that only just at the northern point a above A was an approach possible. Only about at the southern point could a bold enemy here also make an attack, if the garrison was not sufficiently watchful. The enclosing walls were therefore so secured by the natural location, that relatively few defenders were necessary, and also therefore it does not show that rich series of battlements, that we have seen on t the preceding. Certainly of the buildings of the 11 th century little now exists. What interests us belongs to the 12 th century and a still later time. Besides the course of the walls only the eastern tower must still belong to the close of

the 11 th century. An entrance building B, really a tower, s stood on the site of the present one; even so may the first court have been occupied by wooden structures, as today the case (marked L on our plan); just so likewise was a division at the place, where today stands the entrance into the inner court of the castle, then indeed likewise defended by a tower C. Where the principal tower stood must be hard to decide. T The restorer believed that he saw it in a tower, whose remains could be shown near D, and which he again erected. Also t the inner court in any case was occupied by buildings K. Under landgrave Louis III, in the middle of the 12 th century w was the palace built at the east side, and toward the close of the same century under Hermann I, it was raised by another story. Also out palace, like those buildings generally -- which we therefore have to treat in the Chapter on "Houses" -- was not arranged for defense, which was indeed entirely superfluous, since the location made a direct attack impossible. This palace will be mentioned further later. The tower F now stands detached in the court; [65] formerly a wall seemed to adjoin it (?). Whether the wall in this southern portion was a double one already in early times is not to be determined with certainty.

Note 65. It has a certain degree of probability in itself, that this tower was originally the principal tower of the castle, which certainly did not lie in the middle, as for the r regular mounds, but was rather transferred more to the end, in order to stand more properly, as we shall see in other castles, if from the southern point an attack should be attempted.

58. Castle Steinsburg.

If in the plain the mound could be arranged with entire regularity, there must be considered its form, where it was to be erected on the top of a hill; for it would not do to leave some of its rooms outside it, that the enemy could use in order to establish himself strongly before the wall, unless men desired to yield all advantages, that resulted from the elevated location. Thus it is a somewhat irregular oval, that castle Steinsburg shows us, [66] that crowns the top of a hill near Sinsheim in the Kraichgau in the grand duchy of Baden. It forms a part of that network of castles, which had to defend the plain of the right bank of the Rhine. It stands high above

the low hills in the vicinity on the apex of a hill entirely free on all sides. (Figs. 23, 24).[67] the history of this castle is quite dark; it therefore passes for Roman, and Krieg von Hochfelden regards it as such. Today can no longer exist a doubt, that the castle is a rebuilt one of the 12 th century, on the basis of a mound of wood and earth, such as indeed the 10 th century erected.

Note 66. Very beautiful drawings of this castle on 5 folio sheets, that we have also used, are contained in the work;-- Denkm. d. Kunst u. Gesch. of the homeland, published by Soc'y of Antiq. of Grand Duchy of Baden. By its director, A. von B Bayer. Heft 1. Castle Steinsburg in the Kraichgau called the Weiler (hamlet). -- After Krieg von Hochfelden. Gesch. d. Mil. Stuttgart. 1859. p. 88 et seq.

Note 67. From Note 66 of the work first named.

The tower was erected on an octagonal plan, and stands about at the middle of the enclosing wall at H, while at G is t the well, at F a gate, at I a later house, adjoining which a are still other buildings at K, which are certainly later, y yet still show how also originally buildings also adjoined t the enclosing wall of the mound. The tower, to which we shall refer later, although small in its internal rooms and only poorly lighted by wall openings, is yet arranged habitably, at least in one of the stories being arranged with a fireplace. In the lowest story, into which one can only pass through an opening in the vault, it has in the floor a shaft, that has not yet been examined, but in any case was a secret exit serving for escape, from which passages led to the foot of the hill and beyond, that probably extended far enough to pass through them behind the besiegers into the open country. Such passages were of great importance for the system of defense of castles, since they were known to few, and not merely served for flight at the worst time, but also made it possible to connect with the external world behind the backs of the o besiegers, while they caused no danger of any kind to the castle; for without help from inside no one could ascend through the shaft, and even if an enemy had reached the interior of the tower, it was yet impossible for him to cause any injury. But also generally not merely a single passage led from the shaft, but there were several of these, in which one must go

astray, who did not correctly know the way.

Contrary to the usual custom, our tower has two entrances. The one on the southeast side was the regular one, originally the sole access and placed at a corresponding height. Corbels under and over this show that a wooden structure projected b before it. The second entrance at the same height is on the southwest side and led to the upper part of the building I, and was thus indeed originated when this was erected, when t the master of the castle might no longer dwell in the tower, and built himself a house. A ditch evidently did not exist, since the plan had its present form, but on the other hand was a double, and on the northwest side a triple enclosure. (Zwinger). At A one passed to the foot of the castle, then through the third enclosure to the gate B, which was defended by the tower V. The second enclosure C had its entrance d directly at B, the third enclosure D, opposite the point E. Various buttresses on the walls of the enclosure might have been added as desired for stability, and the three semicircular towers X, Y and Z were intended for fortifications; particularly X was important for the defense of the gate A. Krieg von Hochfelden, who held the castle to be Roman, believes that the enclosures were of later origin (12 th to 13 th centuries). Since we assume, that also the castle itself first falls in the 12 th century, we have no opportunity to attribute the arrangement of the enclosures to a substantially different time than the castle. If Krieg assumes, that as we have also indicated this in our section, the rock formerly fell off more steeply from the line of the enclosing outer walls, then we shall not doubt this. But if the terrace of the enclosures was piled up later, we then ask where the material came from? For so long as the world stands, the ground principle was determinative everywhere, that the fill and hollow must equal each other; we see thus in the piled terrace only the deposit of the material, that resulted from the leveling of the terrace by removal of the apex. But if the walls themselves, as they stand, must have been of a rather later period, perhaps of the 14 th century, then was a palisade fence previously on this place, perhaps an earth wall and ditch. That the enclosure became double for this might even occur, that since the palisade enclosure on the outer line must be repla-

replaced, the inner wall of the enclosure must have been built inside the row of palisades, before they could be removed, and then only when they were taken away and wall and ditch w were leveled, the outer wall could be erected. The more enclosures, the greater the obstruction to the siege, and the stronger the castle.

59. Frankenburg in Upper Alsace.

A considerable number of smaller castles, well and systematically distributed, is found on the hills of Alsace and the Bavarian Palatinate, in the Vosges and on the Hardt. Most have already laid long in ruins, and their plans go tolerably far back; at most however very few remains from the earlier time are preserved, and generally they belong to the close of the 12 th or only to the 13 th century in the form in which they remain to us as ruins. They partly belong to a still later time.

One of these castles, that allows its very interesting history to be recognized in the existing remains, is the Frankenburg in Upper Alsace, located on a projecting hill of the Alten mountain at the place where the Leber valley unites with that of the Weiler. It is regarded as the oldest castle in the country, and must have been built by Chlodwig. We owe friendly communications concerning it to provincial architect retired Winkler in Colmar, the architect of the historical monuments of Alsace. According to his communications it goes still farther back; for there are found remains of prehistoric walls beside those of the Frankish time.

According to his opinion, the oldest indeed lie quite below, about 984 ft. west of the later enclosing wall, thus nearly in the bottom of the valley, from which the wall must have extended up the slope of the hill. Halfway up lay a second e enclosing wall, whose southern course is still indicated on our plan (Fig. 25),[63] where it goes from O to A, while the northern course falls somewhat outside our plan. These southern and northern lines unite at the west, following the ground. Winkler believes that they must be regarded as Roman. (?). T The Frankish wall is made noticeable on our plan by hatching the still standing portion, while the rest of course is only dotted. It likewise adjoined the rock A and at C passed to t the north side, where its trace is lost, still farther over

a ravine, probably entirely around the top again to A. It indeed stood on the same place, where now the outermost wall of the southeast side stands. It is very easily possible, even probable, that this entire line of the Frankish wall was preserved during the middle ages, and that the existing wall, w which is attributed to the 13 th century, is only an occasional substitute for the Frankish wall injured at this place by some events. Through the rock A leads a passage, also the old entrance to the castle. We give this portion again in Fig. 27 (at the scale of 1 : 500), since by the smallness of the scale of the plan, it is not sufficiently clear. While the Frankish wall adjoins the lower part of the rock, there rises that of the 13 th century, before it indeed being also the Frankish, till it passes around the peak, on the upper height of this projecting rock, and then continues in a break, becoming narrower, as a second wall to the point D, where a dividing wall transversely intersects all parts of the spiral ascent. Nothing more is to be seen of the way, which formerly led into t the rock entrance, and that indeed extended around the entire castle, so that those ascending always presented their unprotected right sides to the defenders standing on the wall; one ascends directly from the valley and first reaches B, where the remains of a forecourt are found, through which the way passed on its original course (this is dotted on our plan), went through the obstructing wall at D, at E by a bridge over an artificially excavated ravine reached a small triangular forecourt E F, and at F goes into the eastern enclosure. Likewise for clearness this portion is again given (at the scale of 1 : 500). At the east side is found at G the entrance into the proper enclosure of the castle. The southern point of the castle enclosure is strengthened by a projecting structure L existing in ruins, in which Winkler sees a tower in spite of the small thickness of the walls. In the interior of the castle court are remains of different buildings, whose window o openings perforate the enclosing walls, which could occur without danger on account of the elevated location. The proper main tower is round and stands at the northern end of the terrace. It belongs to the 12 th century, while the main wall itself in its lower parts must belong to the 9 th to 10 th centuries, the higher construction to the 12 th. Thus far the c

communications of Winkler, who carried on the investigation with great care.

Note 68. We are also able to give this plan on the basis of the careful drawings of Winkler.

The consideration of the rock terrace shows, that the spiral rise of the walls was substantially compelled by the form of the rock, even if also art not substantially aided the natural plan. It is certain now that the determination from the character of the masonry is not absolutely trustworthy, especially for a castle constantly in use, therefore always kept in condition and improved, where men may have also employed in part the earlier technics in the later time, since this w was to be added to that existing. But doubtless we have to do with a very ancient design, with a hilltop,at latest in the Frankish period enclosed by a wall, which served as a refuge, and down the slope of the hill adjoined the two great walled enclosures, whose masonry Winkler designates as prehistoric and Roman, but which perhaps in spite of the differing technics must also be regarded as Frankish. These two outwords were allowed to fall in the middle ages, when a castle was erected for a vassal, which had to receive no large garrison. While retaining the Frankish wall, that originally extended around the top from A to A, men erected the existing one, may remain established, whether just in the 9 th to the 10 th or only in the 11 th century; that time seems to us not accurately given. For a feudal castle it was then completed in the 1 12 th century.

The chief difference from the ancient mound depends not on the irregular plan of the main wall, that was determined by the form of the terrace, but on the projection of the tower L adjoining the wall in an earlier unusual way. Perhaps the form of the rock gave opportunity, that already in the Frankish time was here a second nucleus of the castle, thus stood a blockhouse or tower; for the round tower M is not removed too far from the centreof the Frankish plan; or since it is later, its predecessor may, determined by the formation, have had j just this place; the proper chief tower was there from the b beginning. Naeher praises the careful work of the round tower, that has three offsets inside. The entrance is found above t the second story. The castle is mentioned in documents in the

year 1105. But we also found, that with the progressive development of castle architecture yet in the 11 th century, in any case in the 12 th century the great tower is a detached work displaced from the centre of the castle, it must serve the defense as an important support in an attack on the main wall: for if its fall was not the result of a sudden surprise, but was that of perhaps a repeatedly repelled regular storm, then could but exceptionally the fortress be retained by holding the tower longer. But this might just as well occur, if the tower stood elsewhere than at the middle. If as we assume, the Frankish tower already stood at M, then just to make it useful already for the defense of the main wall, this may then have been placed at its foot in the 11 th century. But then it was desired to have for the other end of the elongated centre a similar strong point, and the tower L was erected, whose walls have a thickness strikingly small for the 11 th century, perhaps because from its position on the rock, it could neither be undermined nor overthrown.

60. Castle Schlosseck.

With the oldest castles of that group must indeed be counted the ruins of Schlosseck (Fig. 28),[69] of which especially only in the most recent time has the little been brought to light by excavations, that has generally remained.

On a steep projecting hill lies a terrace sloping from north to south, whose southern point A B is set off by a ditch artificially cut in the rock. This separate portion is surrounded by a rectangular enclosure with rounded corners, C D d I. Towers do not exist in the wall, since the steepness of the slope otherwise made access to the wall very difficult. The northern point C P of the wall is thicker than the other sides, being 9.8 ft., since it alone was exposed to serious attacks. In the interior also the remains of a second enclosing wall A B are preserved, which are regarded as the remains of an older enclosure. It consists of rubble in courses, while the outer walls are of good masonry and were faced with carefully cut ashlars with bosses. Of such is built the tower F, that stands behind the north wall, and has a pentagonal plan, i.e., of a rectangle before which is placed a right-angled t triangle with equal sides, a form which we elsewhere first in the 13 th century. So little material has been found in the

ruins, that were excavated and cleared in the last years, that the hypothesis has been proposed, that the structure was not generally completed. Certainly this is now scarcely to be assumed; where may the material have been taken? It may only be, that the last rebuilding in the 12 th century was not entirely finished. A pretty Romanesque portal was found, and was again erected at G as an entrance to the ruins. But whether it originally stood there may we strongly doubt; that the old entrance was found at this place however appears quite probable.

Note 69. From Noeher, J. Die Burgen der rheinischen Pfalz. Pl. 7. Strasburg. 1887.

Of the buildings that stood on the interior of the terrace, only very few remains are visible.

61. Triple Castle above Egisheim.

Of the peculiar manner, in which men understood now to adapt the plans of castles to the conditions of the ground, is characteristic the plan of the castle, that rises on the heights above Egisheim on a high ridge of rock, that affords the most splendid distant view of the Rhine valley. The ridge of the hill, on which the castle stands, has a depression, that entirely separates the southern portion. A second depression coming from the east reaches about the middle of the terrace, so that the centre must naturally be divided into three independent parts, each of which is a castle by itself; they likewise also have three names, the southern being called Weckmund, the middle Wahlenburg, and the northern Tagesburg. In popular speech the entire plan is designated as "the three Exen". Since the top of the hill is tolerably level, all three lie at the same height; each of them is a "mound" by itself. We present here in Fig. 29 [70] the entire arrangement.

Note 70. From a drawing most kindly placed at my disposal by provincial architect retired C. Winkler in Colmar.

The access is from the western side; there must have originally existed only the single entrance at F; but possibly there was at A on the Weckmund one direct to the southern point, where is also now an entrance. The Weckmund I has at the point a building D', from which two walls extend to the rear or broad side, enclosing an area, its lower part still remaining at B, from which the way at C leads through the inner wall i

into the court, just opposite the tower D. At E is found the well. Aside from the building D', whose ruins are rather insufficient for a decision, we have in reality only the irregularly arranged and approximately triangular mound, where instead of the proper ditch are the enclosures on two sides. T The square tower is faced by ashlars with bosses and indicates the 12 th century, while for the remains of walls an exact determination of date cannot be possible.

The Weckmund was connected with the Wahlenburg by a bridge thrown over the depression. The Wahlenburg again consists of a court of irregular and approximately square plan. A round tower M defends the connection with the Weckmund. This enclosure was adjoined on the west side by a broad forecourt or ward with the entrance F, from which one passed at G into an inner forecourt, which by a doorway H led into the castle court of the Wahlenburg, and by a similar one at O into that of the Dagsburg. Grouped with tolerable regularity, there stand in the court of the Wahlenburg the tower I, to which Winkler may assign a greater age than to that of the Weckmund, a house K belonging to the 13 th century, and the ruins of another L, that was connected with the latter at the place where the castle wall could not be ascended from the outside. Between the three buildings is found the well. Only the lower parts of the tower are faced by ashlars with bosses; on the upper parts such exist only at the angles.

Without there being properly visible a correct ground for this, the Dagsburg is regarded as the latest of these, although it is indeed otherwise conceivable, that the entire plan was a common one, even if perhaps constructed as now in a more primitive mode of construction, that was only gradually changed into a later state, a condition that we must elsewhere r regard as normal on account of the limited means of the possessor of the castle. Then since the extinction of the counts of Egisheim occurring in 1116, the entire arrangement came into the possession of the Dagsburgers,and this may have afforded opportunity to assume, that then the Dagsburg was first built. The tower north of this, belonging to the 12 th century, has only a few courses of ashlars with bosses, that otherwise were merely employed at the angles, while the rest of the wall consists of small and well coursed stones. The buil-

building O is a beautifully treated Romanesque residence structure of the 12 th century. Without lying entirely free from assault, it still appears to not be capable of defense; also in the ground story is a simple and unprotected exit door at the north into the open air; thus there must have been at least provisional defensive works before it. The building appears to have had formerly an extension at P. The enclosure R is a continuation of that of the Wahlenburg, only separated from it by a wall.

62. Castle Landeck.

Likewise on the point of the ridge of a hill, that is separated from its main surface by a mighty cut in the rock, stands the fortress of Landeck near Klingenmünster. Its origin is placed back in very early times; on the building period of the still existing remains are wanting definite starting points. Naeher will place it in the 13 th century, while we believe that the 12 th must be assumed. Our plan in Fig. 30 is drawn after Naeher. [71, 72].

Note 71. From Naeher. p. 16, Plate 3.

Note 72. Later, when the block for our illustration was already finished, Col. von Cohausen in a friendly way communicated to us more accurate drawings, which placed us in condition to correct some errors of Naeher, had they been earlier at our disposal. The restoration of the castle in Fig. 31 could still be changed, consequently it does not everywhere agree with the plan.

By Figs. 30, 31 is to be seen, that the inner wall forms an irregular oval, arranged without a tower. The wall is covered by beautiful ashlars with bosses. The principal tower D does not stand at the middle of the enclosure, as in the ancient mounds, but is placed close to the wall. A second external wall with towers surrounds an enclosure, which at the special side of attack is so wide, that yet a third or middle wall finds room before the principal wall. In the external enclosing wall stands the gate tower B, to which led a bridge, both of its piers still remaining. Behind the middle wall is formed a small forecourt at its outer end, through which the way leads from the entrance tower. Through an arched gateway in the main wall one passes into a forecourt cut off in the angle of the main wall by two other walls, and from this, so as

to find himself opposite the principal tower and within the proper enclosure of the castle. Remains of dwellings are found at E and F of our plan; yet they are not sufficient to establish their original form; therefore in Figs. 30 and 31 we have only indicated the plan by dotted lines. The external enclosure of the wall may have been executed first in a later time. The ashlars with bosses on the rectangular tower, as well as the gate tower, show that already the original design was intended for this external wall, besides the internal wall and the principal tower.

63. Castle Wineck.

Also at castle Wineck (Fig. 32),[73] not far from Katzenthal, the tower is entirely backed against the enclosing wall, indeed at that side from which the attack must come.

Note 73. The castle belongs today to the Society for Preservation of the Historical Monuments of Alsace. Our plan is based on the drawings of Winkler, who has also attempted a restoration of the castle, that we have followed in everything essential in Fig. 33. For the first time was the castle mentined in a document of 1251.

It lies on a projecting hill, whose north and east sides a are detached from the ridge of the hill by a deep cut in the rock, over which leads the way to the castle, at A passing o over a bridge, so that indeed at B is to be assumed a lower gateway, remains of which no longer exist, while a greater t tower seems to have stood at C, through which one passed into both the court and the enclosure G, found on the north side. The enclosing wall has different thicknesses, on the east side only about 3.3 ft., while the north side has about twice as much, so that a considerably wider defensive gallery projects from the tower D. At E stood a small structure, and at F a larger one, indeed a palace. The entrance to the tower lies quite high; yet it may be recognized, that a wooden structure was built before it. Where in a castle the palace is directly attached to the tower, which we have also indicated in our attempt at restoration (Fig. 33), the connection from its roof to the tower was arranged. It may still be seenon t the tower itself, that a bay window projection was found on the open side. We think that this existed as a protection of a connection between palace and tower, and therefore have re-

restored this connection as it appears in the illustration. Perhaps we have gone too far in our restoration, in that we conceived this Palace as entirely a stone structure. On the South and West sides Winkler has yet found the vestiges of an external enclosing wall extending from the lower gateway, which surrounded a great forecourt. Instead of this we have drawn a wooden enclosure, as such was indeed first arranged. The wall is given in the plan.

64. Castle Münzenberg.

If we selected all examples in Alsace and the Palatinate, our readers might think, that we represented only a local school with its peculiarities. Therefore we also take once our example elsewhere, although similar ones are also presented there.

We give in Fig. 34 [74] the plan of the castle, which crowns a basalt rock above the little city of Münzenberg in the Wetterau. It is an oval enclosing wall arranged according to the terrace, within which the two round towers G and H stand at a tolerably equal height. This part of the plan may have originated toward the middle of the 12 th century, and may have contained on the terrace a series of not monumental dwellings. The basalt of the rock itself preferably furnished the material.

Note 74. From Moller, G. Denkmäler der deutschen Baukunst. Continued by E. Gladbach. Vol. 3. p. 5, Pls. 25 - 33. Darmstadt. 1851.

The access can also then have scarcely been different, even if the buildings are somewhat later that cover it. From the little city located at the North the way leads to the first gate A, a second B, then through the wall at C; behind this stands a building D, a chapel of the 14 th century, through whose substructure leads the way, although that can scarcely be older than the chapel itself, although it is vaulted with round arches. It is not an original arrangement, but a later addition, that we see in this chapel. Beside it stands an ornamentally built palace E, to which we shall have to refer r repeatedly, but which does not at the same time form the enclosing wall of the castle, like the palace of the Wartburg, that at Nuremberg, but is placed directly behind it which remains intact with its defensive gallery, so that the defensive passage extends around before the palace, without this bi-

place thereby becoming defenceless. This plan shows in the m manner how indeed also before and afterwards in other castles the numerous not monumental structures may have adjoined the castle wall, which stood within the fortification, and many of which may have been higher than the wall, that did not always need to have a considerable height, and could here also be satisfactory with a height of 16 to 20 ft. Thus the living rooms of the master of the castle might afford the pleasure of fresh air and a fine view, without changing anything in t the defensibility by the erection of the palace. For if the height of the wall and the width of the defensive gallery sufficed previously, these would not be the weaker, if a massive wall were behind them. But if the wall were taken at this place, it is found easier to descend into the court, than if n now the enemy had to climb over the parapet wall of the arched windows of the palace about 13 ft. higher. As in all cases, so we also assume in this, that the later walls, as outer lines of defense, surrounded both toward the city as well as o outside the castle at different heights, that they are only reconstructions of older works, that in their places originally at least existed palisades, that the often noteworthy addition of certain parts to each other preferably caused, that before or behind the later wall the old line of palisades or the earthen wall or a wall became defective, that stood on t the true line, and must have been retained so long, until the new wall stood complete. The round towers and bastions of the walls are certainly later strengthenings of certain points; particularly the bastion beside the gate A, as well as the r round one at the western end, first belongs to the time, when at the close of the middle ages men desired to defend castles by cannon.

If we then consider the other buildings, whose remains exist on the terrace, then is H one that requires but little attention, but so much the more I, a second building like a palace about 100 years later than the first. It is turned toward the city, from which it may well be assumed, that the castle sufficiently covered it; for this later palace is not placed behind the enclosing wall like the earlier one, but is set on that, and it is also opened by windows in its lower part, so that in this place the capacity for defense was increased, w

without one could just say, that the hill could not be ascended here. The well K should not remain without mention; although it is filled today, the sinking of it through the rock must certainly have made sufficient difficulties.

What interests us most in the entire arrangement, and has particularly caused us to devote closer attention to the castle is first of all the fact, that it is no longer like the ancient mound with one, but two approximately equal principal towers, in any case of equal importance. Already in the plans considered earlier have we seen, that the tower did not stand at the middle, but near the enclosing wall. A tower that rose high above the latter bore on its platform machines for casting, and at the same time could receive a number of slingers and archers, did not commence to show its importance first, when the inner wall was taken. It contributed to the defense from the beginning; the activity of its casting machines should already prevent, that the enemy could undisturbed and in general take a strong position in the vicinity. If the mound were small, located on the plain and regularly arranged, like the Rüdesheim Oberburg or the palace at Gelnhausen, then was t the central part of the plan quite intelligibly the place, where this tower must stand; but when the castle was irregular and elongated, there wa no longer a most important middle point; the tower must be placed there, where probably the first and strongest attack was to be expected, so that it would protect this. But an elongated castle presented several such places; particularly where the castle stands on a rocky peak almost uniformly inclined on all sides, one need not assume, that the enemy would seek just the well guarded route of access in order to attack the castle. One then could neither utilize a tower at the middle point, that would be too far from each end, nor be satisfied with a single one, that could protect but one half, and so men placed one of these at each end of the castle.

55. Castles of the 12 th Century.

The 12 th century presents a notable phenomenon; we know t that then in court circles men busied themselves not a little with theory; we also know, that men zealously studied Vitruvius and Vegez, and yet were men so practical, as to adhere in each separate case exclusively to what resulted from the ext-

external conditions, as if to what no theory whatever gave, in whose hands man might fall into a mechanical way. Yes, where we see, that where anything is done in a way, since it w was so established, then it was not theory that led to this, but a tradition developed from practice, whose connection with the basal theory we only recognize today with difficulty, and still men were then entirely convinced, that one stood on the ground of this theory.

But if we return again to the classical land of castle architecture on the upper Rhine, we find examples also abundant there, where tradition has already abandoned and forgotten t the way of the ancient mound.

There we also have a series of examples to consider, at which a great rock, that rises more or less vertically, strong by and in itself, since it was impossible to climb it, afforded the foundation for a restricted small castle in the country, that according as separate peaks of the rock rose more or less high, was subdivided into entirely accidental divisions.

65. Castle Fleckenheim.

One of the most remarkable castles of this kind is that of Fleckenheim [75] in Alsace, located on the border of the Palatinate (Fig. 35). [76] On the southern side of a hill too sloping from west to east, that descends in a flat curve to the north, stands a long and narrow rocky ridge, on the west side of which also rises a smaller and approximately square rock. Nature made this rock impossible to climb. Art has further a aided and has made it nearly regular.

Note 75. Koeher, J. Die Burgen in Elsass-Lothringen. Heft 1. p. 13, Pl. 1. Strasburg. 1888.

Note 76. From a drawing of retired provincial architect Winkler in Colmar placed at my disposal, we were in position to correct Koeher's hasty sketches.

The length amounts to about 197 ft., the width is only 20 ft., and the height is 66 ft. This rock is transformed into a castle by considerable works in the interior. At what time this occurred is not to be known. Naturally but little space was found in the interior; thus the flat terrace of the hill north of it must be included, and to the rock only fell the part, that the tower of the caslte played elsewhere. In later times walls and towers were extended around the hill terrace:

originally have been a row of palisades, perhaps an earth wall in their place. The access was naturally on the north side. An artificial ditch A, over which led a bridge B, indeed with an outwork, interrupted the way, that went to the east but t turned to the west at C, at E again to the east, where it ascended to a little platform F at the foot of the rock. Beside the chapel H one came to some steps, that led to the entrance G cut in the rock, adjoining which were the two long stairway flights, which made accessible the various chambers in the r rock. At S is a well cut in the rock and at V a second one, beside the latter being a winding stairway ascending to the platform.; likewise in the isolated western rock Q is a similar one. Little is known of the history of this castle always reputed as not to be taken; the family named from the castle [77] occurs in the 12 th century. Any art forms, that would make it possible to fix definite starting points for the earlier building period are wanting; the later buildings will busy us later.

Note 77. Rudolf of Hapsburg must have besieged it in 1276; in 1674 it was taken by the French and destroyed.

67. Castle Trifels.

Much elongated and running from south to north, there rises on the ridge of the hill expanding at the north into a broader terrace, a crest of rock, which bears the Trifels (Figs. 36, 37), a castle well known for the splendor of its equipment. Its history goes back to Henry IV, who as well as Henry V repeatedly sojourned there; certainly of buildings there nothing remains, that dates before the 12 th century. Again at the T Trifels the form of the rock crest exclusively determined the plan.

The old entrance, after it lay below at the foot of the n hill on the east side, in any case originally lay higher above on the west side, then following the course a along on the n north side until at the northwest at A, where we have to assume that a tower stood, through which it passed steeply upwards to a second gate tower B on a first terrace I, that by an end structure beside B was divided into two parts. A slope of rock and a retaining wall supported this terrace on the north side. A tower B stands outside the plan, in its upper part o being connected by an arch with the terrace. A half tower at

H, which exists in ruins, shows that still outworks existed, even if it may also itself belong only to a later time. In a any case there ran a row of palisades and later a wall, enclosing the way of access and attached to the tower D, around t the terrace of the castle. In the western part of this terrace I was a second crest of rock, which bore the principal buildings of the castle, first the principal tower E, adjoining w- which at an angle was the palace C, and at its south point a also the building F, whose slight remains allow it to be recognized as a dwelling. A stairway at the east side leads to the ridge of the upper crest of rock at the height 2, on which also lies the small terrace on the west side of the palace and tower. Differing from the general custom, the tower has its entrance in the ground story, and through it leads the w way into the ground story of the palace, and from this into the little court 3 somewhat higher than 2, in which is found the well K.

Note 78. Fig. 38 from Koehler, J. Die Burgen der römisch Pfalz. p. 13, Pls. 1,2. Strasburg. 1887. Also Krieg von Hochfelden, p. 228.

We know that the palace of its time was destroyed in order to obtain about 40 marble columns, that were in it. These columns could not have been large, since the limited area of t the castle itself could only allow a limited extent to the p palace. Thus we have to conceive in this a richly treated ornamental building furnished with many little columns, such as was erected at the close of the 12 th and beginning of the 13 th century. On the contrary, the principal tower is almost e entirely preserved. Very low in proportion to the form of the plan, it is one of the few existing castle towers in Germany, that permitted a rather more comfortable habitation, than the previously considered windowless towers, if in a siege of the castle the palace were destroyed, and this tower served as t the last refuge. It will again occupy us later. We can regard as a castle in the proper sense only the before considered n northern portion. The southern part of the crest of rock, which was once separated by a cut in the rock, forms a castle by itself or two of these, the first with a court L surrounded by wall and a building G, that from its secure position on the rock, we can regard as a not defensible dwelling. If one

of our readers prefers to assume, that a tower was found there, then we certainly cannot prove to him, that he is wrong. The cut was doubtless artificial, and the southern part of the r rock isolated by it likewise supported structures, of which nothing more is to be recognized, so that the imagination can be free. We have assumed a simple structure, that served the garrison as a barrack, but are also ready to substitute a defensible structure, whose location made it suitable, if the bridge were destroyed connecting it with G, as a last refuge for resisting an enemy after the fall of the castle.

63. Castle Neuscharffeneck.

More or less determinative for a series of castles in this region was the form of masses of rock, that rose above the ridges of the hills, even if also few could be utilized like the mass of rock of the Fleckenstein. Without being able to exhaust the examples, we name in Alsace the Wasigenstein, Hohen-Barr near Zabern, Lützelhardt, Gross-Arnsburg in the Zinselweiser valley, the Dagsburg, etc.;in the Palatinate being Rödelstein, Altdaten, Frankenstein, Rheingrafenstein and Falkenstein. Most similar to the Fleckenstein is then the condition at Castle Neuscharffeneck. There rises a projection from the hill, an hour and a half from Bath Gleisweiler, a mass of rock B C, not unlike that of Fleckenstein, that as the plan in Fig. 33 shows,[79] stands across the ridge of the hill, adjoining which is a second similar but smaller hill crest at right angles and almost in the middle.

Note 79. From the same. p. 37. Pl. 12.

Access from the rest of the ridge of the hill is cut off by an artificial cut A, that is sunk in the rock. As a comparison of both plans shows, the rocky ridge B C does not have quite the magnitude of that of the Fleckenstein. How far nature was aided in the form of this mass of rock in order to give it i its basal form cannot be recognized; for externally the entire mass of rock is covered by ashlars, so that it appears like a building. We must indeed assume, that on the upper platform was found a roof. Behind this first mass of rock, through which the entrance led and in which different rooms and passages were excavated in the stone, there is also a winding stairway leading upward, and then the wall extended around the hill terrace almost in the form of a triangle with equal sides and

a rounded apex. A cross wall with a round tower I cut off the rounded apex. A second internal parallel wall, that extended to a square tower F, separated an enclosure at the southeast side. A similar and somewhat wider one on the northwest side was separated by the palace G W. To this palace was attached a tower G. In the court extending before the palace now stands in the middle the second ridge of rock D F, forming a dividing wall, whose purpose is not clear, unless a wooden structure found its place on top of it, so that this ridge formed a third line of wall toward the southeast. The centre was apparently first built at the beginning of the 13 th century, which we do not find entirely credible, since such a natural fortification as the rock B C offered, certainly would not have been left unused until that time, although perhaps the covering of the rock with ashlars, the lines of walls and other things m may only belong to this late time.

We have attempted to give a restoration of the castle in Fig. 39 after the sketches of Naeher. If the haste and smallness of Naeher's drawings has led us into error in some point, we cannot remove that; yet the attempt must then be made to draw such a castle, whose chief strength lies in the massive main crosswise structure, directly placed in the way of attack. Nothing more is now to be proved of the palace, that we conceive as an unfortified house in the safe part of the castle; we have also added the bridge for access, and must also allow that it may have appeared otherwise, if anyone so believes. Now is found an entire series of roads around the castle made conveniently accessible, that naturally could only have existed in part. We have indicated on our plan in Fig. 38, how we conceive the original way of access to have been.

69. Castle at Nuremberg.

Opposed to the closely grouped castles of Alsace and the P Palatinate, even if not so extensive as the Saxon ducal castle of Dankwarderode, the combined castle at Nuremberg, standing on a low rock, and in its isolation entirely dependent on itself (Fig. 40), [30] had a considerable magnitude.

Note 80. Our plan here given as well as the opinions are t taken from an essay by the author:-- Die Doppelcapelle auf d der Kaiserburg zu Nürnberg und ihre Bedeutung als Mausoleum der Burggrafen. (Anzeiger für Kunde der deutschen Vorzeit.

Vorzeit, 1878. p. 265 et seq.), to which we here refer. The second part of that Essay, that concerns the general plan of the castle, did not satisfy a friedly loco historian now deceased, who even believed it must be questioned, on the ground of that old view from which the illustration was made. (See Vocke, H. Das burggräfliche Schloss zu Nürnberg. Die Fränkische Stammburg du Zollern und der fünfeckige Turm, das erste Zollern'sche Bollwerk zum Schutze des deutschen Reiches. Illustrated by F. Dummer. Nuremberg. 1882). However what he says has tought us nothing, and the small cuts added by a friend, quite picturesquely drawn, certainly have nothing superior to ours, in that they were drawn on the basis of mediaeval representations; but indeed they show, that the designer had made no study of the general rules of mediaeval military architecture, and therefore could not comprehend, that the castle must formerly have appeared otherwise in certain essential points, than it shows itself today in a mutilated condition. The author has enlarged on this in Heft 4 of "Mittheilunger des Vereins für Geschichte der Stadt Nürnberg." In details of secondary importance, particularly in regard to the castle of the 11 th century, our present representation differs a little f from the earlier one; in particular we are inclined to no longer lay such great stress on the difference of the materials, that we must ascribe the so-called pentagonal tower to the 1 11 th century; yet always sufficiently, to not be able to assume that it is later than the rest of the castle, and was first erected by the Zollers.

When it originated is unknown; it existed in the 11 th century, and it has enclosed the city, that was mentioned before. (Art. 33, p. 34). By the isolation indeed one castle on this place could scarcely be sufficient to receive a garrison large enough to control the broad plain around it. When the castle was arranged after the city had developed, to serve it as a support and a reserve, also at the same time to restrain it, but to serve as the most comfortable residence for the princes, who were lords of Nuremberg, and where the frequently visiting emperor could hold a corresponding court. At least this was the problem, when the castle was rebuilt in the second a half of the 12 th century. Positive historical statements concerning the mighty design we have not; especially is it unknown,

who built it, and even in what year this occurred.

Note 21. The ambitious city of Nuremberg found it absolutely necessary to free itself from the authority of the burggrave, which could only be possible if he were driven out of t the castle, that completely dominated the city. This definitely occurred under Rudolf of Hapsburg, when the latter arranged the conditions of possession in the empire. Thenceforth t the castle appears as "imperial" with a magistrate, only the outer castle remaining to the burggrave. The city soon occupied the office of the magistrate and later also purchased from the burggraves their outer castle, so that after the 15 th c century it was in entire possession of the whole castle. When the castle was erected in the 12 th century, it was just like other castles in the sole possession of its feudal owner, the burggrave, who had to elevate himself as a feudal official to hold and govern, and to whom the extensive lands of the burggraviate were even therefore assigned, that he might be able to support the burden of the office. Since the castle was not the private property of an emperor, no one could have built it, except the burggrave; for the organization of the empire did not permit it to build this for itself.

The ridge of rock is highest at the western end, rising to this from the east, where it slopes into the plain in three terraces. The access was at the eastern side at the foot of the lower terrace through a no longer existing tower, repeatedly mentioned in documents. Opposite this gate tower stands now the so-called "pentagonal tower;" it does not have five sides but in plan approximately forms a square, adjoining which is the half of another cut diagonally, for which plan no other explanation is possible, than that here a smaller half tower was attached to the great square one. This half tower must have been an angle tower of the outer castle, that stood below the first terrace. Since this half tower must have corresponded to other angle towers, its form must then have been approximately as we have represented it on our plan and in birdseye perspective. A wall enclosed this outer castle, surrounding a court according to our assumption, extending to the point, where in the 14 th century was erected the tower dotted on our plan, known as a "lookout." Above the outer castle rose the first terrace. It is entirely enclosed externally, par-

particularly next the outer castle; it has its well and is s surrounded by a wall, that is strengthened on the south side by a square tower. Adjoining the tower is a chapel: otherwise wooden buildings of differint kinds may have occupied the area. Access to this, at the same time the way to the entire castle, leads along the northern wall of this terrace, entirely dominated by the same and by a fourth rectangular tower, 32
to which the way goes d rectly, and at the foot of which is f found the entrance to the terrace. If the outer castle were also taken, then access to the first terrace was not at all free. Along the western edge of this then ran the way to the south, entirely dominated by the wall of the second terrace, at whose base was indeed found a ditch now filled, over which a bridge led to the gate of the second terrace, that was arranged beside a round tower at the south end standing on t the rock. Likewise this second terrace has at the middle its still well preserved deep well and is enclosed by walls; also here may have stood various buildings for horses and troopers, that without monumental construction have disappeared in the course of time, and have given place to the existing huts. O Outside the proper terrace stands the double chapel with a tower. Its projection may indicate the width of the ditch, w which is now also filled, but was arranged before the enclosing wall of the third terrace. A bridge over the ditch led to its gate, that we conceive as a tower. Besides the wall protecting the third from the second terrace,also existed a defensive wall on the north side, that ended at the west with a tower, which was only removed a few decades since. The entire south side of this terrace toward the city on the contrary w was occupied by the palace and the ladies' room with fireplace (the proper living apartments), that were without any means of defense, unless a projecting wooden defensive gallery was connected with the roof. Our plan and the birdseye perspective permit the two divisions of this structure to be recognized. At the western point was added to the residence building another wing in the 15 th century, which is not given on our plan. Also this third terrace has its own wall. We know from reliable statements, that in the 15 th century the castle enclosure was "built.". But a glance at the ground shows, that a similar one must have previously existed, since the area at the

foot of the wall could not remain without defense. Did merely a row of palisades exist, while we find only a wall to correspond to the importance of such a mighty fortress?

Note 82. Its lower part is still preserved under the name of "dwelling of the magistrate of the castle."

We still have to pay attention to the strongly inclined area south of the second terrace and east of the chapel, at whose angle and lower is again arranged a strong rectangular t tower, which bears the name of "Hasenburg" (Haas'' castle), since at some time the family of Haas had it as a fief. According to our own opinion only here can have been the exit i into the lower part of the outer enclosure, while now an entrance to the castle from the city is found there, that cannot have been so originally, since it would have so weakend the castel so much without necessity, that wo could only be astonished at the architect who arranged it. That also the now so called "castle gate," that leads into the open from the first terrace, could not have originally existed, results of itself for everyone, that knows the plan of a castle. A castle of t the 12 th century is never an open road for traffic.

Of special importance for this castle is the system of subterranean passages, that form a connection with the external world and in the last resort made flight possible, when no o other means remained to the besieged. Where the entrance inside was originally is difficult to determine, since a principal tower did not exist, that would be regarded as the last refuge and at the same time as a defensive work. Today this is found in the enclosure at the western point of the plan. From thence proceed a number of passages under the city, one of which ending in the City Hall is still well preserved; the external parts of the system are inaccessible; tradition knows that they extended far outside the existing city. 83

Note 83. They may have already belonged to the earlier castle plan. In Nuremberg the opinion is fixed, that the "private" passages from the city hall outward were so arranged, that t the councillors could secretly meet, and also if the city hall were threatened by the populace, they could escape. Technicians certainly will not understand, how such a great work could have been executed secretly, on which many laborers must have been engaged for years, just about as if men wished to build

a railway secretly now. Where would all the material have been taken secretly, that men would have taken from these passages, that in any case were known to but few, since already in the 14 th century were surrounded by mystery, and must have been planned before the city existed? When we find later, that certain masons were secretly engaged on "private work," they certainly did not make the subterranean passages, but at most i improved them. When the place for the existing city hall was selected, the burggraves already were no longer in the castle, and it may just be the fact, that one of the castle passages ending there may have determined the choice of this place.

In opposition to other restorations, in that we have given we have added to the Nuremberg castle in an entirely consistent way the projecting wooden defensive galleries on the upper parts of the towers and other buildings, and have only omitted them on the palace, since in general it was not defensible. We will not state thereby, that we had proof of their former existance for Nuremberg and not for other structures. These defensive galleries belong just to the mediaeval system of fortification. For the determination of the first occurrence the evidence is lacking for us. If we see how important they are for the defense, how difficult without them it would be to injure an enemy, who had established himself close to the foot of the wall, we must then assume, that their use was very early, and yet the proof is wanting for us. If therefore we conceive a little castle as without such, it would still be difficult to represent to ourselves as without them a castle erected in luxury at the close of the 12 th century. In one respect we indeed already went too far in our publication in 1876 ("Anzeiger für Kunde der deutschen Vorzeit"). As at the palace, we must omit these wooden defensive passages from the chapel, since certainly the chapel also was not defensible, although its north side adjoined the entrance to the third terrace. In reference to the tower at the chapel, we shall not reject the former assumption, that it was already a fortress tower in the 12 th century. That the upper part of it s shows no continuation of the architectural members arranged below is to be attributed to a later rebuilding, in which also the different fragments of another Romanesque building were built in, that now ornament the exterior of the tower. It be-

bears the name of the "heathen tower." It is remarkable how quickly recollections vanish; little more than 200 years, at most 250, had passed since the building of the tower, when a already Meisterlin in his "Nuremberg Chronicle" terms it a heathen, i.e., a Roman work. And now recently may it have only been, that the various fragments were built in on the exterior!

It would always remain striking in the plan of the Nuremberg castle, that it already no longer shows a principal tower, w which served as a last place of refuge, and could still be d defended as such, even if the enemy had already conquered the greatest part of the castle; for if in castles as at Flecken-stein and Neuscharffeneck, this was impossible or unnecessary, since the rock itself indeed took the place of the tower, yet such an arrangement in Nuremberg would have been well possible, whether now the tower had stood in the middle, whether it had been transferred to the safest point at the west, or if at t the east it had opposed the first attack. The centre was not primarily a fortress, but in the first place a residence or court castle, whose dwellings, palace and women's building, stood in the safest place, while the fortification served to keep the enemy away from them. The chapel structure of course in its design may have been conceived as a strong tower, that above the chapel also had stories as a habitation in the most extreme necessity, and may have received defensive works at too, like the tower of the fortress Friesach, to which we shall immediately come; it may be that this purpose originally existed, but in the course of building was dropped, so that men were satisfied with the small fortified tower, which sto-od over the choir, because they said, that around a fortress thus connected with a city, as the case at Nuremberg, such a great army must be gathered before a siege could begin, that there would no longer be any purpose at last in holding with a few men a single tower.

70. Castle Chillon.

The matter stood otherwise at the fortress to be mentioned now, the very well known and frequently mentioned castle Chil-lon on Lake Geneva, which we ought not to leave without ment-ion (Fig. 42).[34] Its importance was based on this, that it stood at a place, where the hills rose almost directly out of the lake, only a narrow path remaining on the shore, and it

was built on a small island close to the shore, so near it t that the traffic route was completely dominated by the castle, , and thus the traffic be actually stopped. It is a formal " "pass". The plan is very old; it belongs to the first period of stone castles, and therefor is very instructive. It is a mound, whose form is determined by the shape of the island.

Note 84. From Naeher, J. Die Schlösser, Burgen und Kloster der romanischen Schweitz. p. 3, Pl. 2. Dorbarune. 1886.

At A is the entrance from the land. The tower D stands in the middle of the court C C'. This court with its walls belongs to the original plan and was surrounded by an enclosure B. We must mention just this plan as secure evidence for the early occurrence of the enclosure (Zwinger), since certainly no one will believe it possible in general, that only the inner court wall actually existed, and that the area of the island outside it remained open. Here the situation must convince e everyone, that from any beginning onward must have existed o outside the inner court wall a low enclosure wall, indeed that the court was only made so narrow to obtain space for the enclosure; for the castle according to its problem must have not too small a garrison.

The side on which the attack on the castle might occur, and at the same time the one by which the road was dominated, was naturally B lying opposite the road and the foot of the hill; here also later the enclosure remained unchanged. From the s side of the water no attack was feared, and so men did not h hesitate to build the palace E in the enclosure, even in the 12 th or in any case at latest in the 13 th century. The other buildings as well as the chapel F, the structure G and the tower H were added in the 14 th century. They now dominate so completely the external character of the castle, that the latter has more the appearance of one such of the 14 th and 15 th centuries, than of the 12 th, although the entire plan belongs to that time.

Note 85. Already after the completion of our entire work a appeared as Heft 52 of "Mittheilungen der antiquarisches Gesellschaft in Zurich" a thorough work of R. Rahm;--"Beschreibung des Schloss Chillon." I. (Leipzig. 1888). In case of a l later edition, we hope to be able to use this Essay).

71. Castle at Friesach.

71. Castle at Friesach.

In describing the plan of the city of Friesach in Art. 27 (p. 26) was mentioned the castle rising on the Petersberg northwest of the city, that had gathered at the castle. On the date of erection of it are lacking reliable statements; as it is represented to us (Figs. 43, 44), it may belong to the close of the 12 th and the beginning of the 13 th centuries.

Corresponding to the form of the rock, it consists of several parts; however none of these are in connection with the city. If one desires to take the way to the castle, he must leave the city by the Sack gate, which in our plan is designated by Z (Fig. 43). From thence he goes in a wide curve around the southwest to the east and north sides as far as the southeast side, and arrives already at some height on the northeast side,at the first gate at X. At the point 15 adjoins a later outwork, through which the way must be pursued farther to the northwest. The entire road lay within shot from the buildings erected on the rock; at the point X he entered the enclosure I directly under the walls of the outer castle, which bore the name of "castle Lavant," while at its outer side was found the first line of defense toward the Metnitz plain. This outer enclosure had its entrance at Y, and consisted of the court 2 surrounded by buildings, from which was reached both the western court 9, as well as through the buildings the inner court 3, adjoined by the principal structure, the palace L. This plan, already strong in itself, had also at the point two towers, the square one I and the semicircular one K. At the southeast rose to a steep height the highest p part of the upper work. Likewise this outer castle was without connection with the opper one, yet was dominated by its rock. Beside it the second gate N led into the inner enclosure 4, that had a tower O, to the gate tower P, from thence f further through the enclosure 5 a into the great forecourt 5, where the city wall adjoined at the semicircular tower T. This tower 5, which rises high above the city, bore the old monastery Church of S. Peter at E, that gave the hill its name, and was surrounded by the towers Q, R and S. Somewhat higher yet lies the terrace b, that was surrounded by buildings and formed the inner castle court. The principal tower A completely projects from this; the strongest defensive work is thus

just set outside the main building. The old palace, the show place of the fortress, that was placed there in the middle ages, is designated by C on our plan, and consists of two wings joining at a rather oblique angle. Otherwise the holding of a court further required an entire series of buildings, t that indeed originally were of wood, later monumentally constructed. Those belonging to the 12 th century, if also existing only in ruins, are indicated on our plan by darker walls. At F stands the kitchen, which doubtless for its mighty fireplace and chimney is termed now the "mint."

The old entrance to the inner court no longer exists. Now one ascends not far from the tower P by a steep and rough passage from the enclosure 5 a up to the inner court. Originally indeed the entrance was in the now lacking eastern wall of t the palace G beside the principal tower A, once defended by this; for the palace doubtless was not arranged for defense, as in general the buildings surrounding the court 6, which by their location were protected against direct attack from outside. Particularly was it actually impossible to approach the wing E, while certainly C and G were difficult to hold, if t the enemy stood in the enclosure 4 or on the terrace 5 after the fall of A. From the court 6 the ridge of the rock rises pretty high through 7 and 8 to the building 9, which was an unfortified house, where two gables still rise high in the a air, occupying the last and strongest place in the castle, t that site at which according to the earlier traditions would have been expected the strongest tower.

We have intentionally not commenced our chapter by establishing a general rule, according to which men in the 12 th century had arranged the castles; on the contrary we have successively merely mentioned small and large castles, to show how varied were the plans, each of which was derived from the special conditions prescribed by the ground. But we have to add a remark of a general kind just to the fact, that in Friesach the strongest final point was not at all arranged for separate defense. Comfortable residence and the greatest possible strength are two conceptions, that conflict with each other. But now in spite of all warlike inclinations of the middle a ages, yet everywhere even in the castle was peace the rule, siege and defense the exceptions, and thus life with its cla-

claims for comfort then made its requirements ever more effective, particularly in a great castle, where court was to be held. But still a purely military consideration also came to oppose this need. Et is certainly right fine and arouses our greatest surprise, when we see the brave defense of a point, when we follow how step by step the ground is contested with the enemy. But it cannot be denied, that not every time was a great and earnest result attained thereby, that in spite of all losses the defenders always maintained themselves, and f finally the last man defended the last sentry box against the entire hortile arms. At each castle must be the concern to d defend the principal work most decisively; but if this had f fallen, it could be of little use to go farther.

When at Friesach (Fig. 43) an enemy held the outer castle, when he had taken the tower A and thus stood in the court 6, then a defense of that could be of no more use. The enemy could spread his great army over the entire area of the castle; in a tower at P only a few men could yet find room. So long as sufficient men existed, they must primarily fight around 5; if driven from thence and limited to 8, then only was the fortress to be held generally, so long as A stood. But help might come from outside, could only bring aid so long as the enemy had merely taken the enclosure 4, or at most if he already stood in 5 and besieged the tower A. Therefore it was i important, that the last principal work should not stand too far within the fortress, that indeed could not be taken, so long as A resisted and there were sufficient men to keep the enemy from attacking the unprotected palace C. Thereby indeed a theoretical ground principle was overturned. If we are in general always inclined to assume, that every fortress was substantially so arranged from the first and must contain all principal parts, that also appeared later, we might here assume an exception, that only results in consequence of practical experience. We may always believe, that formerly in the plan of the 11 th century, the principal tower did not stand at A but at H.

Chapter 6. Earlier Plans of Monasteries.

72. Origin of Monasteries.

Under the first impressions of the teaching of Christ, ascetic men were penetrated by the feeling of the nothingness of the world, went into deserts in order to spend their lives in prayer and meditation, far from the world and all earthly occupations. Their number was not small; they united in a common life devoted to prayer, and at the beginning of the 4 th century a number of such anchorets in the deserts of upper E Egypt had gathered around S. Antony, where they ordered their lives according to fixed rules. This community was entirely separated from the world and passes for the starting point of monastic life. But as soon as an organization once existed, must the absolute disdain of the world be infringed; for the idea of an organization is always indeed secular, and then a also the monastic life gradually reached practical problems, thereby a meaning for the world, just what the first inmates of the monastery unconditionally desired to flee from.

When Christianity and therewith civilization based on the antique was to be brought to the peoples of the North, the monasteries showed themselves as the most suitable means for this missionary activity, and instead of entirely rejecting the world, the monks received the problem, to take a formative part in worldly affairs, and to become a centre as well f for secular civilization as of religious life. The monasteries received the task of clearing forests, creating arable fields in their places, thus to further the settlement of the land; they were to care for the religious needs of those attracted to settle on the lands; manual labor and art, and also primarily architecture, was to be practised by the monks, and learing was to find a place, where it could flourish undisturbed.

Where a monastery cleared off a portion of the primitive f forest, there in the home that the monks built for themselves, travelers found entertainment and lodgings, and so traffic p preferred just those roads on which monasteries were found; indeed occasionally those alone made commerce possible; for indeed even in outlying villages, certainly where hope of gain could never lead one, there the monks settled with the expressed intention to assist travelers, to lodge them, and if nec-

necessary, to give them assistance.

Thereby the monasteries also of themselves became junction points of traffic. From them roads extended on all sides, on which was transmitted the fortunate activity of the wide surroundings, on which all came to seek faith in spiritual things, instruction and help in worldly ones. Thus the monasteries b became little cities in form, and just as before the gates of the castle and of the city, settlements developed, whose magnitude and growth depended on the importance, that the place had for the general traffic, and thus increasing settlements surrounded the monasteries, which were entirely as well adapted to form the nucleus of a city, just as a castle formed one.

73. Fortification of the Monastery.

But the traffic routes not only served for peaceful traders; likewise hostile elements traveled along the road, and then frequently threatened the monasteries, against which they must protect themselves, and since they lay in places, which were important for the defense of the country, they must also participate in this. War also raged about them, and they could not withdraw themselves from its influences. Indeed the monk should not brandish the sword; but it whistled often enough about their ears, and they must protect themselves from it.

The means for the protection of the monasteries were at first ideal. Their peace of God, the sanctity of the place should protect them. The monastery stood upon these, and on the plan of S. Gall, which we placed before our readers in Part II, Volume 3, 1st half, of this Handbook (Plate next page 134), nothing is to be seen of fortifications. Building after building lay open in sacred peace; streets as in a city extended between them in regular arrangement; all is dominated by the church, beside which stand two round towers, that indeed are not fortress towers, but still afforded a wide outlook, and at the same time showed the wanderer, whither he had to guide his steps.

Not always did the peace of God protect the monasteries; t therefore all of them stood under the special protection of the emperor, and since he could not always be personally near them, he appointed a curator for each monastery, who instead of himself had to protect it. There were secular princes in the vicinity, who understood how to bear weapons and could

oppose everyone, who wished to disturb the peace of the monastery. Meanwhile like so many arrangements of that time, the curators of the monasteries but partially corresponded to their purpose. The curator desired to be not merely the protecting lord of the monastery; while he held his shield over it, he also wished to be its master, and often enough the monastery had greater need to defend itself from the protecting curator, than external enemies.

But also these were not absent. Clear is the description, that Hartmannus gives in his life of S. Viboradae [86] and Ekkehard [87] in the case of S. Galli, of the Hungarian invasion, that S. Gall had to suffer in the year 926. The monastery was entirely open and therefore could resist no enemy. Reichenau [88] appears then to have been already fortified, and therto t the abbot in the year preceding the news of the approach of the Hungarians had caused to be transferred for safety the greater part of the treasures of the monastery and the library. Then abbot Engilbert erected in the immediate vicinity of the monastery [89] in all haste a very strong castle. In this he p placed the remainder of the treasures of the monastery in books, silver and vestments, called out his soldiers, [90] had the strongest of the monks take arms, and even armed the serfs of the monastery. Armor of cords and wool was quickly prepared, shields were made aud slings plaited and other preparations were made. The monastic community rapidly became a courageous war army, the people of the vicinity gathered around t the monks in the castle. The Hungarians burned a portion of the abandoned monastery and besieged the castle, but withdraw again after eight days of fruitless exertions, whereon all t that had gathered in the castle returned home, and the monks again resorted to their half destroyed monastery. Naturally the castel so quickly erected, that the monks of S. Gall had defended, was an earth castle consisting of wall and ditch, in whose inner rooms were found arrangements for the temporary shelter of those gathered there.

86. Monumenta Germaniae historica. Vol. 4. p. 454.

87. St. Gallische Geschichtsquellen. Published by G. Meyer of Knonau. Vol. 3. p. 194.

88. Heimanni Augiensis chronicon. Monumenta Germainae historica. Scriptores. Vol. 5. p. 67.

89. Probobly the so=colled Woldburg on the right bonk of t the Sitter 4.6 miles from S. Goll.

90. Free vossols.

Similarly raged battles around other monasteries, and in t the 11 th centuryall must be already fortified. They were partly built in castles, thus for example in the beginning of the 11 th century was the monastery of Ebersburg in the castle of that name, [91] as well as the monastery of castell in t the castle of the same name in lower Franconia. So Berthold of zwiefalten tells us expressly, that the monastery founded in 1078 was surrounded by wall and ditch, since constantly w were hostile invasions to be feared. The monastery was also drawn into many contests, and the monks were compelled to take up arms. But Berthold says, [92] that he never employed them, but on the contrary strongly blamed them for fighting with t the sword; for that is not an affair of the monk, for whom f fasting and prayer are more appropriate. Certainly no protecting curator ever utilized them; for those opposed the enemies of the monastery only for their own advantage.

91. Monumento Germoniae historico. Vol. 20. p. 10.

92. The some. Vol. 10. p. 72 et seo.

74. Monastery included in a City.

Thus as the monasteries became more the seats of secular a activity, they were more required to think continually of defense. This was made easier for them, if they found themselves within the domain and under the protection of the city. t There moreover a series of foundations had found shelter, that in many respects were institutions similar to the monasteries, and only differed in regard to the rule over their domain from the existing monasteries, partly within the walls, partly directly before them; their location was preferable in many respects to that in which the isolated monasteries found themselves. So we now also see a series of monasteries rise directly before the gates of cities. Particularly the Scotch (and Irish) monasteries, that in addition to the completed work of Christianizing in their homes, were even founded in Germany, that originated before the gates of cities and were included by t the extension of the latter, thus at Nuremberg the Egydien M Monastery, at Regensburg S. Jacob, the Scotch Monastery at V Vienna, etc.

75. Cistercian Monasteries.

But also against the secularization of the monasteries at the beginning of the 12 th century a [illegible] reaction [illegible]. Besides the rule of S. Benedict, which until then was followed by all monasteries, there originated that of S. Bernard, which required greater simplicity and severity. The members of the order following the latter were called Cistercians, since they came from the monastery of Citeaux. The number of monasteries, that were erected during the 12 th century on the basis of this new rule, was everywhere very considerable, especially in Germany. In contrast to the Benedictines, who wished to locate at the centres of great traffic, who erected their buildings at points from which the vicinity was dominated, the Cistercians sought the quiet of retored valleys. But the traffic easily found them there. Like the Benedictines 300 years earlier, always where they made a piece of land habitable, there must villages aries and be drawn into the t traffic, and if they sought to complete the work of Christianizing in the German north as well as in the Slavonic east, t they also spread therewith secular civilization, just as previously the Benedictines had done.

Therefore also in the structural works of the Cistercians no difference from those of the Benedictines is to be recognized, except greater simplicity in the external form treatment. There are certainly extensive monastery designs of the time before the erection of the cistercian monasteries, that no longer remain to us; but if we compare the plan of S. Gall with the plans of monasteries of the 12 th century, and see that in Benedictine as well as in Cistercian monasteries, the cloister adjoins the church in a way similar to the S. Gall plan, that is enclosed on three sides by other rooms, just as in S. Gall, we shall be justified in assuming, that also already previously the group of principal structures, that adjoins the church and cloister, was arranged just the same as l later. Separated therefrom, we find on the plan of S. Gall certain buildings and groups of such, each of which served a definite secular purpose. We find the same in the 12 th century among Benedictines and Cistercians. It was no less necessary for the Cistercians to fortify their entire plan, to seek protection behind the earthen wall and ditch or walls of mas-

masonry; for also enemies knew now to find the way to them, and their curators were just like those of the Penedictines, considerate of their own interest.

But we now also from the 12 th and 13 th centuries have more Cistercian buildings remaining to us than Benedictine structures. This may have its basis in this, that the simplicity p prescribed by the rule less frequently produced the idea, that the old buildings were no longer according to the time, and therefore must be rebuilt.

76. Structural Design.

In general, monasteries like the castles, before the 12 th c century may have been almost exclusively wooden buildings, t that were enclosed by an earth wall and ditch with palisades. Just so may all the newly founded monasteries of the 12 th century have been quickly erected at the earliest moment. But doubtless plans and extent were just the same as later. Gradually as the conditions of the time and means permitted, a b building or even a part of one was rebuilt in stone. That men then began with the choir of the church was self-evident in the monastery, just as later men commenced there again, if t they had plans for enlargement, often before all other buildings were rebuilt in stone. Meanwhile the fortifications must nowise be the last subjected to rebuilding. Since in the 12 th century the castles were rebuilt in stone, and men began, where it was possible, to give stone walls to the cities, it was then also for the monasteries. Also here was the procedure t the same, that men only replaced the old fortifications piecemeal by new walls, but otherwise never removed a great piece of the old fortifications before the new substitute was completed.

We have stated above, that a principal difference between the fortification of a city and of a castle did not exist, t thus we have to explain it also in regard to the monastery, that men extended a system of single or double walls, with or without towers and with or without ditch, just as the means allowed, around the groups of buildings; first was built the simple wall, then adding the towers. More than one entrance gate was even as little necessary as for castles; but indeed were needed insignificant portals, externally appearing to t the eye as little as possible, through which at different si-

sides brothers and servants could pass, when they had to betake themselves to the care of the field work on the adjacent land and meadows, if they were busy in the vineyard or forest, if they visited and regulated the fish pond, or would visit the nearest villages in the exercise of the care of souls. I In general the character of peaceful employment and earnest quiet naturally was more prominent in the general appearance of the monastery, than that of warlike confidence, when already the walls were made as strong as possible. Men recognized immediately, that the monastery was not founded for war like the castle, but like the city in the desire for peace. Still the monastery was also a kind of small city, in which care m must be taken for all needs of the inmates.

77. Monastery of Citeaux.

To the oldest monasteries erected in monumental architecture belongs that of Citeaux, of which we give here in Fig. 45 a view taken from Viollet-le-Duc, [93] that indeed only comprises the main group, but still allows to be seen at O the outermost entrance through the enclosing wall, at D being the chapel s standing beside it, at E an inner entrance structure, which leads to the free area of the church A, which was surrounded by the farm buildings of the monastery. Nothing more can be recognized of the fortifications; the single wall as drawn h here was scarcely sufficient to protect the monastery, and we know that still other fortifications were added.

On the contrary, very extensive were the fortifications of Clairvaux, a plan of which is given by Viollet-le-Duc.

93. From Viollet-le-Duc. Vol. 1. p. 271.

78. Monastery of Maulbronn.

But certainly scarcely a more complete and more beautiful example of an older monastery plan has remained to us than that of Maulbronn, which in Figs. 46 and 47 [94] we place before the eyes of our readers in plan and perspective. The scale is the same as for plans of castles (1 : 12000), so that a comparison is easily possible. The preservation of the entire monastery is still so complete today, that only very slight restorations are necessary to have the old view complete.

94. From Poulus, E. Die Cisterzienzer - Abtei Moulbronn. p. 36. Pl. A. Stuttgort. 1873.

The enclosing wall is double; the inner wall has 5 towers,

in one of which was found the entrance gate; in the birdseye perspective one is represented as torn down. Above the monastery and ascending the valley are several great ponds, that not only served for fish culture, but also contained a sufficient store of water, that each lower one could take from the higher, so that even in dry weather the brook was fed, that leaving the lowest one passed through the plan partly above and partly under ground. Since it ran above ground in the enclosure, we must indeed assume, that it was also furnished with dams and reservoirs, that allowed the enclosure to be p put under water, but that even when this was not the case, at a series of places presented an obstruction to the approach to the inner wall, when the outer one had fallen. When also the traffic and thereby the enemy knew how to find the monastery, then it still formed no strong point on a continuous r road, yet it should dominate the vicinity; much rather is itself dominated by the adjacent easily accessible heights in such wise, that it was not in condition to prevent a numerous enemy from advancing; therefore it could with the entire fortification or afford by a defense and primaraly effect this security against invasion by a straggling horde. Hence the w walls are always stately indeed, but still not particularly high or thick. Certainly by attached wooden construction the crown might be made wider, so that on a defensive gallery men could find room. But it is probably that not so many of these existed; for doubtless they limited as much as possible the e expense for soldiers, and scarcely took permanently more into service, than could also sleep in the towers and find shelter; for the other buildings scattered around served for definite and chiefly agricultural purposes. The towers are or certainly were quite high and had several stories; but there were o only a few of them. If then the assumption be allowed, that still more of them were intended, and only were not built, t thus particularly two on the south side of the church (20 on our plan), and two on the north side near buildings 23 and 31, this results from the fact that they were not erected, thus were not found very necessary, evidence that men did not think of complete defense against a great army, and only desired to protect themselves from strolling vagabonds.

Access to the entire plan was thus through the tower, which

then also belongs to the oldest buildings. The rule of the order prescribed, that directly beside the entrance must be found a chapel, which stood at 2, as well as an inn for travelers, which would care for the hospitality of the monastery. This was found in the structure 3, and since men could not t trust every traveler, this projected from the plan into the enclosure as a precaution and was entirely dominated by the tower 1, so that they could also be prepared for any refractory inmates. The buildings 4 to 7, 9 to 14 and 17 to 19 contained the proper agricultural structures, stables, storerooms, and dwellings for the servants of the monastery; 10 contained the mill, 18 was the cellar. These buildings are not monumental, are capriciously located just as the temporary need required, and as in the castle courts stood stables and sheds, ready to be destroyed at any moment, where it often happened that they remained longer than monulental structures. Before the principal group of buildings was necessary a great free space, where the gathered multitude of devout pilgrims could encamp, that on festival days desired to visit the monastery church. The well 16 supplied the multitude with free refreshment; otherwise they brought their food themselves or purchased it in the temporary booths, and there was developed a truly gay worldly life often before the booths under tall shady trees, before and after divine service.

An entirely distinct group was formed by the main buildings. Like the palace and ladies' hall of the castle, there was afforded to the inmates a pleasant dwelling, but in contrast t thereto was entirely behind locked doors. About the middle court of the cloister 27 was grouped everything. Access was found behind a western vestibule between rooms 22 and 23. The door was fast closed, the monks could only leave the cloister if a special mission called them outside; a stranger only had admission to the interior by very particular permission. The abbot of the monastery was an eminent lord in comparison to the modest brothers; he also had to transact business in the world, in him were the interests of the monastery placed. Great and small men must have free access to him. Therefore he had his own house 34 outside the cloister, connected therewith by a passage 32; at 35 was found a house for the curator, at 36 a hospital, and at 38 the great kitchen garden.

Thus was formed the eastern half of the monastery, entirely separated from the western, a world in itself. We find the s same arrangement everywhere in monasteries; but naturally the western half with the proper agricultural buildings and the free space for the collected people were omitted, when the m monasteries had withdrawn within the cities, and simple garden walls occurred in place of fortified walls and towers, for these the council of the city already cared, that desired to have no castle within its walls, that did not belong to it. And a castle indeed was always such a fortified monastery.

Chapter 7. Castles of the Crusaders in Syria.

79. System of Fortification in Syria.

After the crusaders in Syria had founded a kingdom, that w was arranged after western models, but was permanently exposed to danger of attack of Mohammedan neighbors, to which it also yielded at last, the organization of the defense of the country was a matter of great importance. The arrangement of the cities and castles for protecting traffic, for holding d down the people, and for preventing Mohammedan invasions was based on a careful study of the land and its nature. It is t of great interest to see by a map, what places and how thery were fortified. In contrast to Germany, where in Art. 12 (p. 12) we have called attention to secelted examples of the fortification of the Rhine valley at a great series of small cities and castles, whose harmonious cooperation was counted u upon, it must become necessary here for great masses of troops to stay at certain places, and therefore the castles received an extent, even when placed high in the hills, that in part far exceeds those of the West. In general these greater dimensions already afforded opportunity for the development of n new motives. But men also found in the East a series of buildings, which the Byzantines erected there, in which the antique mode of fortification had come to a further development. On this antique tradition and its Byzantine continuation was also based the military architecture of the Mohammedans, against whom the buildings of the crusaders were erected; thus naturally the crusades and the founding of the Christian kingdom in the East must exert an influence on the development of the military architecture of the West. Yet men have indeed o overestimated these, when they wish to refer plans to this i influence, which according to the nature of the matter were entirely developed in Europe itself. Yet if the buildings in the East even proceeded from the conditions there, just as t the western structures from the nature of circumstances. Indeed one sees, that so far as it went, the Christians in Syria endeavored, both in political life as in military architecture, to transfer native customs to the East. The stay there lasted about two centuries, during which a development was c completed here as there. In the beginning no new buildings at all were erected; only gradually appeared the necessity, most

of the buildings, that remain today and afford conclusions on the activity of the crusaders, belong to the last time of their stay in Syria, and what they contributed to the development of military architecture could come into effect in the West only very late. Particularly in where we have followed the western, especially the condition of German castles, not much of oriental influence is to be determined. Certainly we are not in position to determine on the ground of my own studies in the land, whether what is known of the monuments entirely suffices to make possible a final decision; but a cursory examination of the history of the Europeans in Syria for 200 years still well allows one to assume, that this is the case, particularly become accessible since Rey's Study of the Military Architecture of the Crusaders. 95.

Note 95. Rey, G. Etude sur les monuments de l'architecture militaire des croises en Syrie et dans l'isle de Chypre. 1871.

80. Castle near Giblet.

According to him we indeed regard the castle of the harbor city of Giblet as the oldest remaining castle structure of S Syria. We have before given (Fig. 4, p. 29) the plan of the fortifications of the city,[96] on which also the castle located in the southeast angle plainly appears in its plan.

Note 96. The same. Pl. 21, p. 115 et seq.

Although the scale, as for all our city plans, is only one sixth that at which our castle plans are drawn, we still hold it unnecessary to repeat again here the plan at a greater scale. But we expressly request a comparison with Fig. 2 in regard to magnitudes, where the same castle, that we have given in Fig. 43 at the same scale as the other castles, is drawn at the same scale as that of Giblet, so that at once the size of the simple plan of our oriental castle plainly appears in contrast with that in the Metnitz valley. This is especially necessary, since we have to indicate, that this castle is quite nothing more than an enlarged repetition of a western mound, and if one will compare it with the mounds of Rüdesheim (Fig. 13, p. 48), then the different scale will not be forgotten.

The city of Giblet came into Christian possession in 1109 and remained therein till 1190, when it was yielded by agreement to the Mohammedans, to again be in Christian possession from 1199 to 1266. As deduced from the remaining details and

especially the general use of the pointed arch, the castle m may have required rebuilding after it again passed into Christian ownership. But the plan in any case belongs to the earlier time, and must have resulted soon after 1109.

The tower (keep) will be mentioned later. As evident, there existed beside this 5 other towers, of which the southeast o one is lacking today. When Rey believes, that the centre had an entrance from outside, on the contrary that leading from the city to it at the East not existing, we cannot agree with him. Certainly the south wall of the city cannot have had its defensive front toward the castle, but as the outer wall of the castle it must have been turned toward the city, and if we desired to proceed in our imagination concerning the existing remains, we should have then placed towers in the angles, corresponding to those of D and F.

81. Some other Castles.

Nearly according to the same plan, as this castle located in the plain, was built the castle of Blanchegard [97] about 1140 on the ridge of a hill between Jerusalem and Ascalon, w which in 1187 fell into Saladin's power, and today being destroyed, its plan may be only approximately recognized. The r rectangular principal structure was surrounded by a rectangular wall with 4 towers at the angles; at one end appears to have been placed a forecourt, likewise rectangular.

Note 97. The some. p. 123.

Just the same appears to have been the castle of Ibelin, [98] of which today only formless ruins exist. Likewise the [illegible] of [illegible] [98] is described as a little castle consisting of a rectangular wall with 4 angle towers and without ditch and o outer wall; one of the corner towers was thicker and more massive than the others; no vestige of these exists any longer.

Note 98. The some. p. 125.

82. Castle of Saona.

Besides there entirely regular plans are also found others, in which just as in the West the shape of the rock was determinative. We have mentioned in Art. 29 (p. 28) the plan of t the city of Saona. This is divided in three parts, of which the castle forms the middle one. We represent this in Fig.48 [99] at the scale of the other castles (1 : 2000). The plan must belong to about the middle of the 12 th century; for in the

year 1187 it was lost to the Christians. But today it still stands, preserved in its extent for the greatest part, as an example of an oriental feudal castle.

Note 99. From the some. p. 105 et seq, Pl. 12.

Of the buildings that covered the terrace within the walls, only vestiges remain above ground, underground certainly being vast storerooms and cisterns. Its principal side seems to have been the eastern, attached to which is also the massive two-story keep. The astonishment od all time has always been aroused by the ditch cut deep in the rock, that separates the east side of the castle from the city. At its middle remains standing an obelisk of rock as support of the bridge. This east s side has semicircular towers, like those we find on western buildings, and these towers like the western only have their platforms at the height of the defensive gallery, appearing to be intended to receive defenders. This side must belong to the first flau and date from the first half of the 12 th century. On the contrary the south side, and so far as can be k known, also the other sides must be later, and show the great rectangular towers, that also on their sides, so far as they were turned outward, contained slots for using crossbows. The crown of the wall as well as the tops of the towers were surrounded by battlements, whose verticals have about 2 1/2 times the width of the spaces between, being something over 6.6 ft. wide to 2.6 ft. clear width of space. On the upper parts of the verticals are still to be seen the supports for movable shutters for the protection of the archers standing at the o openings. The towers themselves have two stories, the lower one covered by tunnel vaults, but the upper by simple yet massive pointed cross vaults. Striking is the consistent use of the pointed arch in the otherwise entirely simple architecture, built of massive blocks of ashlars with bosses, even if we assume that the towers were entirely erected just before 1187.

As a striking occurrence also appears to us the fact, that men obviously endeavored to utilize also the ditch, at least in time of peace, for the purposes of the garrison, and indeed it served for keeping the horses, for which the mangers were cut in the rock at both sides. Holes for the reception of beams show, that temporary roofs were arranged as a protection

for the horses. In order to produce a connection with this d ditch, there was found in the tower A an exit doorway, from which a way must have extended down into the ditch; meanwhile however the horses could not be brought into the castle court through this doorway, that lay considerably lower than the c castle court, to which one passed by a narrow stairway in the wall. Thus there must also have been other connections, or t the horses were abandoned to the enemy at once, if the men w were compelled to withdraw into the castle. Nothing is to be seen of a second external wall. Aside from this, that it has probabality in itself, when one also here believes himself j justified in assuming before the proper enclosing wall also outworks above or in the valley, we must still think, that on the south side, where between the wall and the slope of the hill remained free a convenient way, this was not uncovered. But we have also a description by an Arab writer of the taking of Saona by the Mohammadans, who put forth the greatest exertions, by which they finally succeeded in overpowering the f fortress. In this he speaks of 5 enclosures that were in existence, and that we cannot possibly refer entirely to an oriental imagination.[100] When Rey is of ofinion, that 5 separate works must have been taken there, this circumstance still seems to us just as unacceptable, since we can just as little recognice 5 in the existing ruins, that were indeed necessary to secure the possession. Yet it is expressly stated in the narration, that the Mohammedans climbed up the rock to the c castle, and at one place neglected by the Franks took the first wall, then gradually the second and third, that they found there great store of horses, oxen and provisions, whereon the Franks withdrew into the nucleus work of the castle, but in the knowledge that further resistance would be useless, purchased their departure. If we assume that by this nucleus work is to be understood the keep, then must the existing enclosure have been the third, two others having laid outside it.

Note 100. It is now certainly difficult, if one cannot read the original Arabic text, to depend on translations, that perhaps are not entirely correct, especially where technical expressions come into consideration.

83. Castle of Karak.

A castle of the 12 th century is that of Karak, the Petra

deserti of the middle ages, whose plan Rey gives in his Plate 12 after drawings by Maas.

On a mighty hill terrace, that is connected with the adjacent hills at the southwest and northwest ends, stands a considerable city. The ridge, which at the southwest end connects the terrace with the hill, is isolated by two ditches cut in the rock and bears a great castle, whose inner court is about 656 ft. long. It consists of two terraces, on eastern and lower, and the higher trapezoidal western court. Already in 1138 it was surrendered to the Mohammedans after a siege of two y years.

84. Castle of Beaufort.

Entirely a similar design also has the castle of Beaufort (Fig. 50),[101] except that it is considerably smaller.

Note 101. From Rey, p. 127 et seq., Pl. 13.

Not unlike a European castle, it lies on the crest of a hill of rock, that toward the east falls almost vertically almost 984 ft., while also at the west the fall is very considerable. At the south the ridge of the hil widens into a terrace, on which in the middle ages a city had settled before the gates of the castle, toward which the castle arranged a strong line of defense. Beaufort in 1139 fell into Christian hands, in w which the castle remained until 1192. Saladin had then obtained the castle by surrender after a hard siege, when the garrison was compelled by want of provisions to desist from farther resistance. When it likewise in 1240 must again be yielded by agreement to the lords of Beaufort, the Mohammedan garrison revolted, and the sultan must first besiege the castle and compel his own troops to surrender, before he could fulfil h his obligations, and could transfer the fortress to its master, who soon sold it to the Templars, from whom it was however taken again in 1268 by the Mohammedans, whereon it then r remained lost to the Christians. Under these circumstances, Rey holds it very difficult to determine exactly to what times belong the separate buildings now remaining. The drawings given by him naturally place us still less in condition to give a new decision; however it may still be recognized, that the original plan of the castle can scarcely have been different, and if the Arab fortress was not already arranged similarly, then must we assume, that Beaufort soon after the capture of

the year 1139 would be so arranged as drawn in the plan in F Fig. 50. Then the fortress was besieged in 1192 and 1240, on which occasions it may have been so treated, that its possessor preferred to leave the rebuilding to the rich order of Templars. To this restoration made at the middle of the 13 th century must belong most of the existing works. For this in particular also speak the massive stone slopes, which surround the south and west sides next the ditch, and whose design we meet with on several works of the 13 th century.

Of the old plan we can only speak in the main lines; to it may belong the mighty ditch cut in the rock, that encloses t the castle on the entire west side, enlarged to double width at the south with an offset like a terrace. The ascent from the east side was scarcely possible; thus it may have been on the west side from A to B, then passing along the ditch and at C on the eastern terrace, which was defended by the towers D and E, that in connection with those at I and K and a tower S, which necessarily must have stood over the cistern now found there, formed a mighty front toward the city. The eastern terrace, which rose above the slope, was guarded by towers, and defended by a wall according to the shape of the projection F of the rock toward the northern ditch, in case any enemy should climb up in a ravine there. But he would then find particular resistance in the tower G, which still already in the first plan had a probably round predecessor. Above the eastern terrace rises the approximately triangular inner court of the castle, the entrance to which over the rock was led to H, directly under the protection of the upper wall, where it enters an enclosure, then to pass through a gate L by means of a passage like a tunnel into the inner castle court, a way t that could be made extraordinarly difficult by the defense. Of monumental earlier buildings there only remains in this c court the tower M and the hall-like building O. Other monumental and temporary buildings may have occupied the remaining space, particularly the southern part at L. In any case a principal tower belonged to the original plan; we are inclined to seek it at G, and believe that M first became such in the 13 th century.

Nothing more is to be recognized of a fortification of the city, than at the southern point a work with great cisterns

P and R, in which Rey, contrary to our opinion, may recognize the only work of the Templars.built in Beaufort in 1260, and that he designates as a new castle, but which was at once destroyed after the conquest of 1268. This surrender also further resulted from an agreement, after the garrison had recognized that further resistance was useless.

85. Castle at Tortosa.

Besides the castles of the great feudal nobles, with which we most count Beaufort according to its plan, even also if t the castle was rebuilt by the Templars, there now arose in Syria further the castles of the orders of knights. While the first belong to the 12 th century, the castles of the orders are characteristic of the 13 th century.

In the year 1183 was transferred to the Templars Tortosa, in the possession of the Christians since the beginning of t the 12 th century, when the fortified it, and made the castle (Fig. 51) [102] their mightiest place of arms.

Note 102. From Rey. p. 69 et seq. Pl. 8.

It has approximately the form of a quarter ellipse, whose l longer axis from north to south forms the seashore, its shorter one extending from the shore into the land from west to east, on the east side adjoining the wall of the city. The elliptacal line of the enclosure of the castle consists of a d double wall with towers, and a double ditch cut in the rock into which the sea could enter, and entirely separate the castle from the city. About at the middle of the north side projects from the external enclosing wall a mighty gate tower C into the ditch and parallel with the length of the wall, whose beginning - on the former seashore, now somewhat retored, started from the land. At one place B was found a sliding bridge. A number of buildings in the interior belong to the course of the 13 th century. The most important part must have been the principal tower E, which was separated from the castle by a ditch also cut in the rock and filled from the sea, so that it could only be reached by boats. Unfortunately it is entirely destroyed, so that only few ruins remain. In consequence of this it is impossible to determine whether it is that tower, which already in 1188 so victoriously resisted t the endeavors of the Mohammedans in the siege of Tortosa by Saladin, and which in the year 1211 Wilbrand of Oldenburg pr-

praises as founded by a king of France. It exceeds in extent all towers of the middle ages. If our drawing be correct, it is certain that all the massive battering walls at the foot of Syrian military structures, which serve the twofold purpose of presenting great difficulties to undermining and increasing the resistance to earthquakes, in consequence of the frequency of the latter, particularly as a result of the destruction caused by the earthquakes of 1202, which first came into use in the 13 th century, then this keep with its massive battering base may also first belong to the 13 th century.

The massive double walls to be mentioned later may belong to the beginning of the 13 th century, about the second decade. But they could no longer be seen by Wilbrand, or at least the outer wall must not have yet existed, since he emphasizes the number of the towers as 11, to which the one that surprised him so much is added as a twelfth. On the inner wall alone c could about 11 towers be conceived, if one thinks of those e existing in Fig. 51 as remaining. Rey is surprised by the luxury of the materials of this fortification, that is found in no other structure of Syria, and he is of opinion that antique buildings must have been robbed extensively for it. Indeed by plundering earlier works could so beautifully uniform ashlars with bosses be found in such abundance? The Templars must have first surrendered Tortosa in 1291.

36. Castle Chastel-Blanc.

Entirely different from this castle of the Templars located at the sea was built that, which under the name of Chastel-Blanc (Fig. 52) [103] crowns one of the foothills of the mountains above Tortosa and likewise belonged to the Templars. The great earthquake of the year 1202 reached and destroyed the castle, after it had already been taken and destroyed by the Mohammedans in 1167.

Note 103. From the same. p. 65 and Pl. 9.

We must indeed attribute the inner part of the structure to the beginning of the 13 th century, although Rey would assume still the 12 th centuryfor the chapel with its pointed tunnel vault, and ascribes the external enclosing wall alone to the middle of the 13 th century. The arrangement, whose plan is given in Fig. 52, again recalls the western mound. Placed as an oval on the top of the hill, it still appears to have been

surrounded by an oval wall, that we have represented on our drawing, although only at the east and west sides small portions remain, while on the other sides, the heaped earth has slipped down the hill. Now the massive wall with its battering ashlars at its base forms the external enclosure. At three places it is strengthened by the towers O, P and Q. According to the analogy of western buildings must we perhaps assume, that it was first constructed without towers, and that the t towers were first added gradually, and even more of them were to be built, pasticularly on the west side, if conditions had allowed. An entrance building, whose plan is not entirely clear and includes remains of different times, leads into the interior. Perhaps at the northeast at B was the passage over the earthen wall; perhaps also men passed over the ridge of the hill from A at the south side over the wall; then they went through an outwork and the gates D and E into the great entrance court. In this stands the great tower K surrounded by walls, to which one passed by the route F G H J; on the w west side, where the entrance to the tower was found, the enclosing wall was doubled, and on the exterior of this is still added a small projecting structure V. The space between the inner and outer walls was occupied by vaulted structures, that served as workshops, magazines and stables. The massive principal tower contained in its ground story a great and lofty chapel, above this being a hall in two aisles, and at the top a platform for defense surrounded by battlements. Below the chapel, as at the tower of Giblet, is cut out a water cistern of great extent. The castle with a garrison of 700 men fell into the hands of the Egyptians in 1271.

37. Castle Starkenberg.

The part of the Germans in the crusades was not so considerable as that of the French or Franks, as the orientals named the crusaders, and still term Europeans today. Meantime it h had found embodiment in the Teutonic order of knights, that also found expression in the erection of a castle. That was castle Starkeuberg, that was built by the Teutonic order where the hills of Galilee approach the Lebanon, on the edge of a hill with outlook on the sea between Tyre and Acre, at which latter place the order had its seat. Like a castle transferred from the banks of the Rhine to the Orient, it appeared with

its German name, besides which the French name of Montfort 104 was certainly also common in the 13 th century, according to the author of the Essay on the military architecture of the crusaders. Meanwhile the imagination excited by the German n name may have contributed much to this; for unfortunately it is so found, according to the description, that this original castle of the Teutonic order is in a condition of advanced d destruction, that scarcely allows a decision concerning its former appearauce. But so far as such a decision is possible, as for the principal tower, even the relation to the other o oriental castles is not recognized.

Note 104. See the some. p. 143 ond Pl. 15.

In the year 1229, after Hermann von Salza had obtained the ruins, instead of an earlier structure was begun the existing one, for the purpose of safely preserving there the treasure and the archives of the order. Below in the valley (Fig. 53) 105 stands at G the ruins of a building, that by some is regaried as a chapel, but by Rey is considered a house belonging to the castle. If this be the case, then certainly must the fortifications extend down into the valley to the bank of the little river H (the present Arab name is Ouady-Korn) and its branch stream T. The ascent follows the dotted line a from t the north side around the west side of the hill and along the south side, till the entrance is found at A at the southeast angle. Meantime whether this line indicates the original way is uncertain; in any case it is against the rule, that those ascending to the castle must have it on their left and not the right side, certainly not the only exception [illegible]. At A the way leads within the enclosing wall of the castle with its towers. The terrace proper occupies the southern half B. There is found the principal tower D, whose dimensions in plan can be shown in no German castle. West of this lies an inner court C, and E is a long hall structure with a narrow forecourt. Under all these buildings are found cisterns and cellars. Outside the enclosing wall yet stands a great square tower, that contains a well in its lower part; it stands on a rock between two great artificially widened ravines, and t thus covers, as an isolated fortress, the weakest part of the castle just at the place, where over the ridge of the hill an found the easiest way for attack. We recall on this, that a

similarly located tower is found at the fortress of Trifels. (Figs. 37, p. 77). Like that, so may also this have been connected in its upper part by a bridge with the inside buildings of the castle. After a fruitless siege in the year 1266, after a reiterated and longer siege the castle was surrendered in 1271, and was destroyed by the Mohammedans.

105. From the some, Pl. 15.

33. Isolated Towers.

Besides the great castles there existed a number of smaller stations, where only a single tower was erected, at such distances from each other, that an unbroken connecting line was produced, without that the single tower with its small garrison having the problem of resistance to a hostile army. Two stories high with a platform on top, they have sides of 33 to 40 ft., underground being a water tank cut in the rock. To r reach the second story and from thence the platform was required a ladder, since the doorway was found at the height of the beginning of the vault several yards above the ground. R Rey represents the tower of Tokle from the great number of s similar buildings, that he allows to follow the somewhat larger one of Kermel, which was adjoined on two sides by a quite narrow and somewhat wider forecourt. We have no certain statement of the building of these towers. They may belong to the beginning of the 13 th century. Since then they exhibit progress in contrast to the previously described German buildings, that they are rather calculated for a distant contest, than those. They exhibit narrow slots behind which could be found places for archers or crossbow men, and the battlements of t the platform have slots in the verticals, by which the archers could send their arrows without being compelled to appear in the space. Since the slots were also found still lower than the spaces, and passed obliquely downward through the wall, one could still hit an enemy through them, who had already c come quite near. Thise slots in battlements are also found tolerably late in Germany. Likewise in the different stories of the towers are they seldom found as systematically arranged as here. They mostly have the purpose of admitting light, rather than for shooting. Certainly in France they already occur in plans, that are likewise attributed to the 12 th century; yet whether they were brought here from Syria or from

thence to Syria must remain a question, so long as the priority here and there is not proved by accurate historical investigations.

89. Castle of Knights of S. John, "Krak of the Knights." The most important of the castles of the orders, and at the same time the largest of them is the castle of knigths of S. John, which bore the name of "Krak of the Knights." It is a military plan of the first rank, which dominated the road from Homs and Haman to the Orontes near Tripoli and Tortosa.

Formerly occupied by the Kurds, the Krak was taken by the Christians about 1125, and was transferred in the year 1155 to the knights of S. John with other castles. How it then appeared cannot be established with certainty. It was repeatedly injured by earthquakes in 1157, 1169 and 1202, and it seems to have been entirely rebuilt after the last one. So long as it was in Christian hands, it was in the 13 th century of the highest importance, always the greater the more the Christian rule shrank, and we must therefore assume, that its strengthening was constantly continued. Thus it was held until in 1271 after a siege of two months, it was surrendered to the Mohammedans. After the transfer the Krak was again restored by its new possessors, so far as it had suffered injuries, and it s still appears today almost as when the knights left it in 1271. We give its plan in Fig. 54 [106] and a birdseye perspective in Fig. 55,[106] in which the few restorations necessary are made, in order to present the design as it was originally.

Note 106. From the same. p. 39 et seq., Pls. 4 to 7.

On the summit of a hill sloping to the north and east, at the west separated from the other hills by a ditch, that also extends around the work at the south, though indeed not very deep, the castle forms approximately a trapezoid, as whose c chief side of attack is to be regarded the southern, where thus the strongest defensive works were arranged. The castle consists of two main parts, each of which has its principal works at the south, the inner nucleus being surrounded by walls and towers, whose buildings are covered by terraces and enclose the court, with the outer enclosure. Evidently then is this the latest portion, even if only a few decades lie b between the erection of the principal work and that of the enclosure. About this outer enclosure may further have been

placed wooden structures and earthworks, which in the course of time doubtless would have received a monumental treatment, had not the Christian rule previously ceased; for so important and however strong was the inner lien of defense, then so far as it was executed, must the oute one avail as the principal line, and it is not probable, that men had the intention to allow the enemy simply and directly to come to it. Not even a ditch cut in the rock over which led a bridge, lies before the tower at the east side, in which is found the entrance at A. The small depth of the ditch at the south side shows us i indeed, that the work was not entirely completed there, when the castle must be left, and that not only there was this continued, but such had also been undertaken on the east side. We believe that in the buildings of the Krak must be assumed the last stage of the development, which Christian military architecture had attained in Syria.

The tower at A was therefore not so simply to be taken. It lies lower than the terrace of the enclosure. The doorway of access at A could be defended by the three bays above it with open floors. One then passed first into a tunnel B, that ran to the south, but turned at the southern point behind the tower C and ascends to the tower F. The two southern portions a are open to the sky, so that even if the enemy had reached t the tunnel, it still remained always possible to pelt him with arrows and stones from the enclosure, as well as from the platform of the tower C. But the entrance to the enclosure w was found under the protection of the tower F only at the last end of B, where the road led through the tower F and the building G also into the inner court. Through the doorway A therefore the enemy could scarcely penetrate into the enclosure. If he desired to make a lodgement therein, it was necessary for him to overthrow the outer wall at some point and storm the breach. To not allow the enemy to succeed in this, it was not merely so arranged, that from its platform outward the f fight could be carried on behind the battlements; but by passages found in the interior, the defenders could pass in them at different heights, and through slots cast a hail of arrows on those approaching. But what was particularly important is the series of bays extending around, through whose open floors men could pelt the enemy, who wished to engage at the foot of

the wall in its destruction.

Of the towers of this external wall, the three of the east side are rectangular, the others are round; only in the middle of the south side stands a lower but massive square tower. Its height is indeed only so small, that in modern language one must rather speak of a bastion than of a tower; Fig. 56 106 gives the internal view of it in its present condition. It is evident from thisthat its platform only rose one story above the ground of the enclosure. It is surrounded by a strong wall, through whose length extended a vaulted passage. To make its external side more resistant against shots, a strengthening is arranged outside, built on corbels. Between these corbels are found slots in the floor, through which direct shooting of the assailants was possible. A passage on this wall was furnished with a series of battlements. Similarly as for this tower is the arrangement also for the two rectangular towers of the east side, located south of the entrance and with massive batter on the lower parts, as also for the round towers and the intermediate wall of the east side. The greater part of the south and west sides of the enclosure is so a arranged, that the water was collected there, that flowed from the other parts; it was doubtless connected with the cisterns, that are placed under the upper castle. The inner work rises on the south and west sides above a batter of such thickness, that scarcely anyone would attempt to undermine the wall. Yet hardly under the otherwise massive walls of the work did even the battering wall extend; doubtless we have here only an inclined facing of the rock before us, on which stands the upper structure. On the north and south sides still appears the rock without such a covering, whose execution was doubtless postponed to a later time, but never came to construction. Fig. 57 106 shows us the middle and western of the two towers, the first of which was further strengthened above the batter by an external defensive passage at its base. Between the towers are not merely arranged simple walls, but wide structures covered by terraces, on which could be placed casting machines, and that were surrounded by massive walls, which besides the upper series of battlements also shows the passage in which a lower row of defenders could move. A great flight of steps leads from the court I to the terraces, of which V is

the lowest, while F, G and L, as well as O, P and Q represent the actual crown of the wall. In the tower H is found the chapel, on the other hand in a reentrant angle in K is an exit to the enclosure. The portion V of the wall rises higher than the rest; but highest is carried the part S of the wall, namely up to the platforms of the towers R and T, that were connected by its crown. In M is found a hall structure.

One sees at once by the great and extensive buildings, that the Krak was a castle, that should receive a far greater garrison than others. Wilbrand of Oldenburg speaks of 2000 men, who were found there, when he saw the castle in 1211. The more the rule of the crusaders failed, the more important became their last supports, and so much the more was it necessary to increase their defensibility and their garrison. How many defenders the fortress contained at the time of the surrender to the Mohammedans in 1271 is not stated within our knowledge; if Chastel-Blanc had 700 of them, there must have been here well toward 4000. The Mohammedans put the castle again in condition, so that it now became for them one of the most important supporting points, until the entire departure of the crusaders.

The last principal fortress of the knights of S. John was Margat, which had many similarities in form with the Krak, particularly also the massive battering masonry, the strong round towers, the series of bays, etc., and which they held until 1285.

Chapter 3. The later French Castle Plans.

90. Castles from the end of the 12 th Century.

The considerable development, that military architecture especially in the plans of castles, was taken from the middle of the 12 th to the middle of the 13 th centuries in Syria, was compelled by the serious situation in which the crusaders fell more and more. In Germany was no ground for such development in that period. Indeed with the decay of the imperial p power appeared for the individual the constantly increasing necessity to maintain his castle capable of resistance; but since the invasions of foreign peoples was excluded, and since in consequence of the continued despersion of forces by the ceasing of the organization of the feudal system, great armies became ever more difficult to collect, and thus war by whoever made, could only be carried on by small masses of troops, so that it was sufficient to protect each castle against surprise and a possible siege, by a small body of men. But it was also important to so arrange it, that the smallest possible number of men could defend it. How this was effected, we have seen in the consideration of the different little fortresses of Alsace and of the Palatinate. At a somewhat greater scale had conditions developed in France, where the Normans in particular, who had become masters of England, measured their forces with the French kings. Thus also greater works were necessary.

91. Castle Gaillard.

One of the most prominent and important of these was castle Gaillard built by Richard the Lionheart on the Seine, thoroughly treated by Viollet-le-Duc. We can indeed only follow him in the main lines; we must partcilualrly omit here the peculiar situation and the description of the connection of the castle with a series of other strong places, and refer to the s study of Viollet-le-Duc. We reproduce in Fig. 58 [107] the plan of the castle.

Note 107. From Viollet-le-Duc. Vol. 3. p. 87.

It consists of two separate parts; the approximately hexagonal main castle and a triangular outer castle. At the foot of the hill the Seine forms a lake, whose entrance is barred by a small city located on an island, from which a bridge leads across the Seine, which is also made impassable at the

foot of the hill by several rows of piles driven at the place, where the border lay between France and Normandy and crossed the Seine. All the fortifications erected there lie on Norman territory, and castle Gaillard itself cuts into the French d domain like a wedge. Steeply rise the rocks from the Seine, and at their upper part are so steep, but on the west side t they pass down in a slightly sloping plain. The ridge of the hill, on which stands the castle, continues to the southwest, and from thence also must the enemy approach, who would assa-il the castle. The access indeed leads to it through rocky r ravines at the north angle; no enemy could utilize this alone. Through a ditch cut in the rock is the outer castle surround-ed on all sides; another entrance from the main castle over the separating ditch toward the northwest side does not rem-ain. The arrangement recalls in a sense that of Saona (Fig. 3, p. 28), where likewise the western part B is separated by the ditch from the main castle.A. The differences result from the closer consideration itself; for here the point A is turned toward the ridge of the hill, there to the valley.

This outer castle, besides the enclosing walls, consists of 5 round towers, A, B, B, D, D. Two such similar towers C, C stand in the enclosure of the main castle opposite the rear towers of the triangle; from them the walls extend obliquely outward, till again round towers fortify the angles. This re-gular half of a hexagon forms the outer court F of the castle. In it was found a chapel H, the well F, under it and cut in the rock was the cellar G. The other half was required by the ground to be irregular. It forms only one enclosure around t the inner court of the castle, which is enclosed by a wall e elliptical in plan and a ditch I lying before the same, over which at L a bridge leads to the gate K. On the side of the Seine on the place, where the frontier line through the Seine ascends the hill, the separate projections of the rock are f further defended by other fortified towers and walls T, so t that they could not be ascended by bold climbers. At a tower V halfway up adjoins a wall descending to the shore of the r river, that also joins the obstructions in the Seine. The ma-in castle is distinguished by its peculiar walled enclosure, that consists of a row of closely set semicircular towers, so that they could oppose more resistance to projectiles, and at

the same time could offer more varied shot lines for the defenders. The plan of the bridge L is so arranged, that not merely the gate building K is opposed to it, but that it also has the round angle tower behind it, so that no enemy, even if he had penetrated into the forecourt and the enclosure, c could dare to attack the bridge and the gate K, so long as a also the round tower in the rear was not taken, that formed a strong fort itself. Opposite the gate K stood then the great keep V, whose defenders could combine with those of the gate structure. The building behind the keep continued the resistance. O is further a defensive tower located at the northwest, beside which a small connecting portal leads out of the inner court into the enclosure. At R and S is the proper entrance.

However excellent was the design of the construction of this castle, however strong and unconquerable it seemed to contemporaries, still it could not resist a long regular siege, such as after the death of Richard the Lionheart the French king Philip August undertook, and it must surrender in the spring of 1204. We reproduce in Fig. 59 [107] a view, that Viollet-le-Duc drew of this siege, in which over the ditch of the outer castle was first built a causeway, then a breach was m made in the outer wall, and the tower at the point fell, on which the outer work must be abandoned. In the lower story of the building H were privies, that had an opening externally; through them some Frenchmen passed into the interior of the building, to penetrate into the inner court, and there apply fire, so that the small garrison, in the belief that a great number of Frenchmen had entered, fled to the inner castle. T The bridge L was left in excavating the ditch in the rock, only being interrupted by a drawbridge next the castle. The French then brought a machine on the fixed part of the bridge, under the protection of which they began to undermine the wall. The garrison indeed made a countermine and drove out the hostile miners; but by mine and countermine was caused a weakening of the wall, so that this fell under the great blocks of stone, that the catapult threw against it. The French took t the breach, and the little garrison no longer had time to retreat to the keep. The castle was thus conquered directly from the point. Philip August at once had it repaired. If it could not hold out, yet a very small garrison made necessary months

of hard work for it, and if the garrison had not been too weak and perhaps too little attentive, the end would scarcely have been attained.

92. Castles of the 12 th Century.

We see that this castle, that was built at the close of the 12 th century and in the course of a single year, as reported, although it was large, still was right small for the proper needs of the life of the castle lord, and yet less were those of the garrison cared for. We may judge from this, that this could still less be the case in the little castles, and yet it was shown here, that the castle could indeed restrain an enemy, but that a small garrison was not even in condition to permanently resist an enemy. But there now developed at the courts of princes and of the greater vassals life in peace e ever more varied, and it set greater requirements, and when we must already see, that in Germany for the more pleasant life in peace, there will occasionally be erected a palace a and living room, that do not contribute to the greater strength of the structure, we must not wonder, that also in France the claims of the comforts of life in the castles became ever greater, and more and more appeared in the foreground as opposed to mere fortress construction.

Castle Montargis, [108] which in the 13 th century was erected in the plain, is first the mound built at a great scale, an irregular trapezoid enclosed by a wall beset by towers and surrounded by a ditch,at its middle standing a round tower; but an entire series of structures in the interior adjoined the enclosing wall, built monumental in a way, so that one c can scarcely longer regard the fortification as the chief thing. It is a strong building, but no longer a castle.

Note 108. Viollet-le-Duc. Vol. 3. p. 103.

93. Castle at Coucy.

This condition goes yet farther in the castle at Coucy, whose plan and general view we reproduce in Figs. 60, 61. [109]

Note 109. From the same. p. 109.

The castle was built about 1225 -1230 and forms the angle of the little city, from which it is separated by a ditch, a and toward which is turned the principal side of its fortifications, its walls however being attached to the fortifications of the castle, so that the city forms an outwork. When ap-

appear to have thought the rock on which the castle stands to be held strongly enough, and were satisfied with furnishing the four corners of the trapezoid with massive towers C, D, S and T, on the long side also allowing a half tower L to project at the middle. Monumental buildings with thick external walls connect these towers. In their lower parts they have no windows in the exterior, but indeed at a greater height, where they could be placed out of reach of the storming ladders; d doubtless the buildings gradually originated, partly indeed only later. At the erection itself at first indeed only the external walls were rapidly built to a certain height to make the fortress secure, as we still find this at the Louvre, whose first building was completed just then. But the towers h have slot-shaped openings for shooting in all stories, so that an enemy approaching the wall could be shot from these towers. But in particular all buildings bear a later defensive gallery on projecting corbels, and through the openings in i its floor an enemy at the foot could be mose effectively fought. The round towers have massive stone corbels before their series of battlements, on which similar outer defensive galleries could be placed. It is remarkable, that the defensive galleries could of the buildings were turned not only toward the exterior but also toward the castle court, so that men w wished also to defend the buildings, if by surprise a small body of the enemy had succeeded in reaching the court, before the entire external defense had ceased.

As the last main fortress we again meet here with the mighty round tower B, at whose foot is also found a ditch V' extending around it, and like a cloak, a thick wall with batter at its foot passing around it. In the batter is found a passage in the outer wall, that is in connection with the cellars and stairways of the building, but from which still a separate stairway Z led to the defensive gallery of the wall. To the gate of the tower itself one passed over a bridge, that led above the ditch V'. The tower contains in each story a high round vaulted hall. In the thickness of the wall are found w winding stairways, as well as certain little rooms. In general the tower has but few window openings and slots, the defense must therefore be especially made from the platform. As at the angle towers, so also on this was arranged a row of

great corbels for placing a wooden defensive gallery, that a according to all appearance had two projecting stories over each other.

The interior of the building is partly constructed with great architectural expense; particularly occur magnificent halls; the chapel is a prominent piece of ornamentation, on the contrary nothing is to be seen of important outworks, of a s second enclosure and the like.

94. Castles of the 14 th Century.

Men experienced that the number and bravery of the defenders were more decisive than strong construction, and desired to not permanently reduce the comforts of life, in order to merely oppose better the enemy in a moment of danger, if they were always directly equipped for it, i.e., they had a careful commandant and trustworthy men, without utilizing also the g greatest strength. In general also the system of mere inaccessability was found not exclusively advantageous; for the strength of the earlier castles occasionally caused, that where no secret exit existed, men simply sat fast in the castle as in a mousetrap, if the road of access was held by the enemy, and the gate was besieged. A sortie was made extremely difficult, since through the narrow entrances the defender could send out his men with such a narrow front, that the assailants were in condition to enter, while the assailant had to deploy his men there. Therefore also in Coucy besides the strongly defended entrance to the castle, which led from the city to it, there was yet arranged a portal, through which one could pass out of the ditch of the keep through the city wall and over the city ditch into the open country.

95. Castle of the Louvre.

In the close of the 13 th and the first half of the 14 th centuries, the power of the feudal nobility in France diminished in favor of the royal authority. The great vassals and yet more the lesser ones were pleased, if they could retain their castles in defensive condition; extensive structures c could only be considered by the kings.

For a buildiug such as the castle of Coucy, no vassal longer had power and means. As the most important structure, on which the advances of military architecture appear, we therefore m meet with the royal castle of the Louvre, 110 of which we give

a general view in Fig. 62. [111] The castle has a rich history, that is also expressed in its plan.

Note 110. Viollet-le-Duc. Vol. 3. p. 122 - 140.

Note 111. From the some. p. 137.

As well known, nothing more of the mediaeval structure remains today; but old views, drawings and descriptions, excavations in the earth, etc., enable the Frence investigators to give a view thereof in a surprising way, that must scarcely be regarded as a hypothesis. Thus count Clarac already in 1 1826-1827 could draw accurate plans of the building, Which Viollet-le-Duc has utilized.

The Louvre then lay outside the city, whose walls Philip August erected at the same time as this castle, that adjoined them. Certainly the Louvre had the problem of protecting the city against an enemy, who could aslend the Seine; but he must also dominate the city. Whatever outwork it then had is no longer to be determined; the east front toward the city, that later existed, must perhaps have already existed then, since it continued the city walls, even if an opposed sense. The s square court with the round tower surrounded by a ditch is s still retained here from the mound. As a centre and most important part of the whole was alwayu regarded the middle tower; it was always the castle proper. There the vassals took the oath between the hands of the king; they bore their fiefs from the "Tower of the Louvre."

Wherein the building of the 13 th century already differed from other castles, was in the plan of the gates, of which t the Louvre had one in the middle of each of its four sides in opposition to the rule, that each castle should have but one gate. This was required by the peculiarity of the problem. N Not only must the connection with the royal court be here possible on all sides, it could also be necessary to throw troops quickly out on all sides, and first of all the king must not sit in a mousetrap; if a vassal or the "faithful citizens of Paris," who must be kept in check by the castle, attacked to drive him back before the gate. The king was in position to keep a sufficient garrison; each of the four gates was a little castle, under command of a reliable commandant, and strong enough to resist an attack. Opposite each gate the assailant found the gate tower before him. The walls themselves were r

relatively low, so that one from the exterior could see over them the casting machines, which stood in the interior of the court, [112] ready to receive every assailant. On the other hand, they were furnished with massive round towers and surrounded by a water moat. Little is known of the buildings in the interior of the court, and it appears, that the castle in the 13 th century had only a military importance, since the palace that comprised the S. Chapelle on the island of the city, in which at least S. Louis dwelt, served as the residence.

Note 112. Is this assumption of Viollet-le-Duc correct?

Charles V (1364 - 1380 erected extensive buildings at the Louvre, and under his government it appears, that the building previously outside the city, first taken into the city by him as an extension of the city, must have received the form shown in our view, namely with walls increased in height, behind w which extended wings of the building, that were crowned outside by defensive galleries. These wings of the building also had external window openings, while on the outside next the court they were partly developed in rich and splendid architecture. The greatest ornamentation appears to have been possessed by the side of the north wing toward the south, adjoined by a stairway tower, that was treated with the most magnificent and ornamental architecture, and from which a gallery was erected to connect this wing with the main tower. Toward the north side were no outworks before the moat. The gate at this side was mostly closed. At the west were attached military and other royal buildings, that enclosed a great place, so that only two little towers guarded the entrance to the bridge beyond the ditch. On the south side toward the Seine was a broad forecourt, too wide to term it an "enclosure" (Zwinger), in this was built a little castle before the bridge, which one must pass through, after also passing an outwork, that lay beside the city gate, in order to pass out of the city through the city gate into the interior. It is very interesting to see, how the outwork, the outer gate of the castle, t turned its defensive front toward the city, while the city g gate located beside it faced to the other side, but still in possession of the royal troops could also be used against the city. Along the bank of the Seine extended also a city wall with towers, that yet enclosed an area, certainly not in con-

connection with the castle, at whose lower side beyond the c castle again lay a little castle with an outer gate, which f falls far outside the lines of our view, that one must first traverse besides the outer enclosure dominated by the castle, if he would pass through the gate into the interior of the city. But toward the city was directed not merely the front of the mentioned outer gate beside the city gate; further was found on the entire east side of the castle beyond the moat also a wall facade with towers, before which extended another moat, and that was strengthened at the middle by a little outwork, through which led the way from the city to the east gate of the castle. After it was taken into the city and was surrounded on the west and north sides by royal buildings and gardens, the fortifications of the Louvre had only the purpose to protect the king, who found in it a comfortable residence, against the city and its citizens, and to hold the city, open to the castle, in the power of the king.

96. Castle at Vincennes.

With greater regularity than the plan of the Louvre is that of the castle at Vincennes (Fig. 63), [113] that lies in the p-plain and forms a rectangle of about 656 × 1145 ft., and thus is one of the largest castles, only exceeded a little by the Marienburg.

Note 113. From Viollet-le-Duc. Vol. 1. p. 393.

As also originally at the Louvre, so is here only a relatively low enclosing wall with a defensive gallery and surrounded by a ditch, whose four angles are occupied by strongly or projecting rectangular towers D, E, F and G. The eastern longer side is further strengthened by three towers, that have the form of keeps. The northern and southern ends have in the middle of each a gate structure, so that the two entrances A and B lie so accurately opposite, that one can speak of the exactness of the plan for mediaeval buildings. The western l longer side has a gap, not in the middle, but somewhat more to the south, in which is inserted through the great castle ditch a rectangular ditch entirely enclosed by walls, surrounding an independent rectangular enclosing wall, at its middle rising the square keep C with four angle towers, which stands there as a fortress by itself and erected after the model of the old mound, completely separated from the enclosing wall

of the castle. The latter is nothing more, in which our opinion recogniqes the conception of the castle in general, than a great rectangular court dominated by the keep, and in which a series of buildings are found, placed at need here and there, indeed originally arranged also with a certain regularity, as the parts of our plan marked I still show, but gradually by the removal of some, additions and rebuilding of others, became entirely irregular in certain parts. One could just as w well place a city in this enclosure. But the plan of the fortress is regular as scarcely a second, so regular that it can only be compared with a Roman camp, which was intended for a great army. The building is a work of Charles V, and thus belongs to the second half of the 14 th century, when the wars against the English compelled the king to form and maintain great armies, just as at the same time the Teutonic order proceeded, and for this purpose erected its Marienburg.

While the enclosure is so great, and doubtless also the original design was so regular, that the entire work has the most striking similarity to the city plans of the 13 th century, in spite of its two gates, it is not intended to carry the traffic of a citizen population dwelling in the interior. But it should still be not merely a strong point, that had o only the garrison necessary for its maintenance; rather should it shelter such a one, that could also be opposed in the field to the attacking army of an enemy. But such an enemy c consisted of soldiers, whose faithfulness was not always reliable. Therefore also the most complete isolation of the keep, in which if besieged by his own soldiers, the commandant must not regard it as impossible to dominate the camp as well as them. Such a castle was naturally an exception. it cannot be compared to the castles in which the feudal nobles sat, and which were always transformed more into comfortable dwellings.

97. Castle at Pierrefonds.

The further development for the residence castle meets us in Pierrefonds, begun in the first years of the 15 th century, which Louis of Orleans erected under the government of Charles VI, and that in spite of its strength, because the garrison was not supplied with necessities for being able of hold out in a siege, must surrender in 1420 to the English, as it already during its erection was compelled to yield to a siege by

transfer to the troops of the king Charles VI in the war with his brother. We reproduce in Figs. 64 and 65 [114] the plan and a view of the castel from Viollet-le-Duc.

Note 3. From Viollet-le-Duc. Vol. 3. p. 151, 157.

This rises on the not very broad crest of a not very high hill above the city, that extends at its foot on the west side. The form has not entirely that regularity shown by the castles of the Louvre and of Vincennes; but it still allows to be recognized that such regularity was striven for, so far as conditions allowed. We no longer see here enclosing walls, behind which were later added buildings, but structural wings arranged from the first, that were strengthened by towers and furnished with defensive galleries. At the south extends before the castle a rectangular court, which indeed is not completely reproduced on the plan, but is visible in our view taken from north to south. An external wall encloses an area around the entire plan. As evident in the view, the entrance leads to the castle at the southern end of the western enclosure; one then passes across the entire enclosure, first its western and then the north and east sides, near the southern end of the latter to pass through a gate building into the forecourt. At A one passes by a bridge over the ditch, that separates the forecourt from the castle, and at B enters the southern part of the castle court. On the right hand and beside this entrance lies between E and F an approximately square b building, which we may regard as a reminiscence of the keep of the former period, which does not have the height of a tower, but that of a dwelling, and that is terminated by two gables at east and west. Toward the forecourt adjoins a higher semicircular tower G, next the side of the court being a square tower H, surrounded by a ditch; a stairway tower C with elegant vestibule and a flight of steps form the ornamental part of the building. The western wing D is the palace, a hall structure, whose interesting construction [115] combines occupancy with capacity for defense in a very complete manner.

Note 115. Viollet-le-Duc. Vol. 8. p. 86.

We certainly shall not fail to remark, that what Viollet-le-Duc gives are plans of restoration, [116] in which indeed many details certainly cannot be proved as original, but which still must be substantially correct. Before all it is to be no-

noted, that no windows are on the exterior except those serving for defense, then that above and around the building extends a defensive gallery, which takes its way through the tower, wide enough that men can move freely everywhere, projecting on consoles, just as we found it at the Krak in some places, built 15 years earlier. As there, here also is a second defensive gallery above, that continues to project around the towers, that above still have two rows of fortifications.(Fig. 66).[117] At the middle tower this system is again doubled, so that thus 5 rows of fighters could stand above each other. To the palace adjoins at a right angle at the north a similar w wing, to which is added at the east obliquely a narrower wing, that only extends to the middle, to the chapel E, which as a tower projects far from the face of the building. From the c chapel to the angle tower is only a single wall beside the c court F, but arranged at the height of the other buildings, so that the defensive galleries go entirely around the whole plan. At the south side between the angle tower, that again is crowned by a fivefold line of defense, and the square building to be termed the keep, lies in each story an entire series of services, which in their extensive arrangement indicate, that a considerable garrison must have permanently remained in the castle in order to man the grand defensive arrangements. These soldiers may have lived in the towers. The hall structure and the residence of the rulers could be completely isolated from the defensive galleries, but with them they could be put into connection at any moment by opening the doors.

Note 116. Thus it occurs, that the details of this hall building do not entirely agree with what he has given in Vols. 1 and 2.

Note 117. From Viollet-le-Duc. Vol. 1. p. 388.

98. Later Castles.

The history of this castle also shows, that even the most excellent defensive measures were worthless, if they could n not be utilized in the moment of danger. Without this being attempted, the fortress must surrender in 1420 to the English, since the most necessary things were lacking. Wherefore should men allow their lives there to be embittered by fortifications ?

Castle Creil again was built 100 years later on an island

in the Oise, and therefore already has little more in common with a castle; on all sides are open wings of buildings opened by windows, between which are attached only an entrance t tower with drawbridge and round towers at certain points, merely as still reminiscences of the strong castle. A projecting defensive gallery, that continues around the entire edges of the roofs of all wings, was always an important means of defense. If brave fellows in sufficient number stood behind, this residence equipped in this manner could pass as strong enough, and we shall return to similar plans in Chapter 10, that primarily must be habitable, and but incidentally had the problem of protecting the occupants in case of danger from a momentary attack.

Chapter 10. Later German Castle Plans.

99. Castles of the 13 th Century.

If we follow the development further, that had been completed in the castle architecture of Germany, we shall have only in part the same representation as in France.

What made itself felt in great princely castles of Germany already in the 12 th century was the need of caring for greater comfort, and indeed in the succeeding period, just as in France, it ever became more pressing. But indeed certainly then in Germany great castles were also the exception, in the 13 th century, smaller ones being the rule.

Where in one of the castles of the 12 th century we found in use a pretty and convenient palace, we had everywhere to note, that this convenience was only to be attained at the cost of strength up to that time, where absolute inaccessability did not make the strength generally superfluous. But the conception of strength also was changed. Where a great court must be held in a castle, strength was not so important. Either the soldiers of the guard formed a living wall, that no m man dared to attack, or the fortress was in general not intended to withstand a regular siege. Where the master had at command a sufficient number of men, he did not seek protection in the castle, but desired to overpower the enemy in open combat in the field, and compel him to retreat. Thus the strength of the castle was only useful against sudden surprise. But where a little castle occupied a point, and a small garrison must hold it fast, there a court life could not develop; these we still find in a relatively late time, when the need of greater comfort had long since appeared everywhere, and every dissatisfied man complained strongly of the little castles, in which strength was exclusively determinative, which must receive only a small number of men experienced in war, who w were still little accustomed to the comforts of life. For the small war, combats with neighbors, the revolt against the feudal lord, and then his attempts with few men to compel the v vassals to submission, continued until toward the close of t the 13 th century.

As we have seen in the French castles, the improvements introduced in the meantime to increase the capacity for defense of the castles were only of value, if a corresponding number

of men existed, as already the fact also in the Orient, that each castle had a great number of men, which led to the improvements by which it was possible to use the men corresfondingly. The dispersion of power in Germany caused, that each of the many little castles only had at disposal a very small number of men. There was no use in making doubled defensive galleries over each other, of increasing the number of slots, e etc, when no men were there to occupy them. Therefore such a advances could but very slowly be introduced into Germany.

The endeavor to most thoroughly utilize every advantage offered by the location, to compensate for every weakness resulting from it, led to the irregular forms of our German castles, as they preferably developed, when they experienced in t the 12 th century a monumental rebuilding, and many new ones were erected, that no more like the old, had to serve for the defense of the entire country, but must only ensure the property of its possessor.

100. Castle Hugstein.

If in the meantime we have said above, that men zealously busied themselves at that time with theoretical studies, this indeed assumes that men thought of normal and regular plans. About the close of the 12 and the beginning of the 13 th centuries, we therefore find in Germany also in the mountains c castles of quite astonishing regularity of plan, structures in which nature appears overpowered. We find several of such in Alsace, the classical land of castle building. Naeher gives the plan of castle Hugstein (Fig. 67), [118] that by its regularity again recalls the mounds of earlier time. It must h have been first erected by abbot Hugo von Rothenburg, to secure the route through the Laach valley by Gebweiler to the A Abbey of Murbach.

Note 118. From Naeher, J. Die Burgen in Elsass-Lothringen. Heft 2. p. 6, Pl. 2. Strassburg. 1886.

The masonry is constructed of boulders and fragments of the primitive stone found there. It is an approximately square c court with rounded angles, that the castle shows us. The entrance is at the north corner, where a bridge leads over a ditch through a tower C into an enclosure dominated by the tower D. The principal tower F was round. It was faced with sandstone ashlars with bosses, which indeed indicates a somewhat

earlier origin. Likewise the considerable thickness and height of the walls are indeed a sign that the Hugstein must go back into even the 12 th century. The chief contrast to the earlier German mound lies in this, that the round tower is displaced into the enclosing wall itself, indeed that side is moved back, against which the attack must be made from the hill terrace. The outer wall of the enclosure on this side is placed quite near the interior, so that both walls could at the same time participate in the defense; likewise the angles of this enclosing wall are rounded off. A broad ditch extends around the plan on three sides, but on the fourth where the slope of the hill by its steep inclination would not allow a storm to be expected, the ditch is omitted; but on its three sides it is further surrounded by a wall I.

101. Castle Hohenlandsberg.

Substantially larger than the Hugstein is castle Hohenlandsberg, particularly striking by the regularity of the plan, c certain parts of which still go back into the 12 th century, while certain buildings of it fall in the 14 th and 15 th centuries, in part still later. The castle was destroyed in 1673; yet the ruins still permit the entire plan to be recognized. (Fig. 68). [119]

Note 119. From drawings placed at our disposal by provincial architect retired Winkler in Colmar. -- Also see Naeher, J. Die Burgen in Elsass-Lothringen. Heft. 2. p. 4, Pl. 2. Strassburg. 1886. Naeher however believes it necessary to assume, that the entire plan first belongs to the 14 th and 15 th centuries.

It consists of a regular rectangle enclosed by a wall 8.2 to 8.9. ft. thick with rounded angles, and that is 259.3 ft. long and 213.3 ft. wide. In an angle stands a structure on an elevation not unlike a mound, likewise a regular rectangle, from the middle of which rises the rectangular tower D. Adjoining this principal building at one end is arranged a lower rectangle 42.6 ft. wide and enclosed by thinner walls; one e end of which contains the entrance. The inner court is not l level, but contains several teraces of rock. At A is found t the entrance, which first leads into the forecourt B and then into that at C, from thence both on the rock to the mound D, and into the inner court, where is arranged a covered cistern

E; but a well is also found in the mound itself, so that this could hold out, even if the remainder of the castle was taken. At F and G exist small exit posterns. Besides the buildings indicated in our plan may have existed several; for the castle is merely a wall, that could be better defended, the more men it contained, thus the more fellows that could find shelter in the buildings in the courts.

102. Castle Landsberg.

To the largest castles of Alsace belongs the Landsberg on a projection of the Odilien hill, erected about the year 1200 by Conrad von Landsberg, in whose family the castle remained until the French revolution.[120]

Note 120. See Koeher, J. Die Burgen in Elsass-Lothringen. Heft. 1. p. 28, Pl. 8. Strasburg. 1886. -- Our illustrations are taken from drawings placed at our disposal in the most friendly manner by provincial architect retired C. Winkler in Colmar, architect of the historical monuments of Alsace. An attempt in its restoration unfortunately reached us, when the block of our view in Fig. 70 was already made.

By a ditch cut in the rock on the north side the hill terrace is separated from the ridge of the hill (Figs. 69, 70). It is so wide, that only the western part on which rises a s separate rocky peak higher than the eastern, which is occupied by the castle. The northeast portion of the terrace is enclosed by a wall and forms a forecourt M, around which the way leads from A to the gate tower B, beside this turning toward C and passing through the enclosure, leading at D into the inner forecourt E, thus over a small terrace and over a flight of steps to the larger side of the palace, that consisting of two rectangular wings must have been made perfectly habitable, but still as proved by the corbels on its longer side, had o over the little Romanesque choir a widely projecting bay[121] for the defense of the entrance beneath this. Behind the palace and completely separated from it rises the high tower G. At H and J stood buildings, the first of which the wall K L with windows made defenseless, while in the plan, as the two towers K and L prove, since they also lie directly opposite the ridge of the hill, was conceived as a main work for defense. Also on the upper part of the tower are built in several consoles, for which we assume that they extended around and

supported a defensive gallery, while Winkler assumes here single bays. The access to the tower was found in the narrow little court between it and the palace, but high above, so that a connection with the roof of the latter was possible, and t the occupants in the hour of danger could flee into the tower, and break down the bridge behind them. The wall of the forecourt E likewise shows consoles at some places, so that it is well to assume, that a projecting defensive gallery crossed it, which perhaps was first placed on the wall in the 14 th or 15 th centuries. When we still indicate it on our attempt at restoration in Fig. 70, we must remark, that the southeast part of the terrace could not remain open, but in some way m must be enclosed, which we conceive to have occurred by a wooden enclosure.

Note 121. Winkler assumes in his attempt at restoration, t that it was a projecting defensive gallery, which extended h horizontally around the entire palace to the tower, whereby the general appearance would have naturally an entirely different character. We believe him to be in error, to state this here expressly.

103. Watch Towers.

Between the separated castles also stand in Germany, just as we have before considered such in the description of the Syrian castles, watch towers as intermediate posts. Such a o one is still fiund near Wohlfahrtsweiler not far from Carlsruhe (Fig. 71), isolated in the forest. It is square, stands on a little hill and is surrounded by a ditch. A determination of its date is indeed scarcely possible. If we further conceive it equipped with palisades, then this tower is just a small mound [122], intended for a little garrison, that had to guard the traffic on a road, to observe the approach of enemy, and to quickly inform the nearest castle, to which also the little garrison retreated, when it had engaged the vanguard so long, that the garrison of the castle had made the necessary preparations. Such an advanced post could naturally only fulfil its problem, if it found itself in reach of a castle, or of several lying together and intended for combined action. Then even a little garrison could temporarily stop a road, that was alone entirely unable to hold it.

Note 122. Noeher, J. Die Umgebung der Residenzstadt Karlsr-

Karlsruhe, etc. Carlsruhe. 1884. -- According to our theory, that the conception of the castle appears in the fortified e enclosure and not in the buildings standing within the fortifications, such a tower is always a little castle, as which it cannot be explained by what we state of it here.

Such regular plans, as we observed in Hugstein, Landsberg and Hohenlandsberg, however always form the exceptions in the mountains, where men can derive advantages from the shape of the terrace and its surroundings. Therefore also in the 13 th century and later, most of the mountain castles and particularly the smaller ones, are not regularly arranged as before.

104. Castle Ortenberg.

We give as an example of such castel Ortenberg in Alsace, (Figs. 72, 73),[124] that indeed belongs first to the 13 th century.

Note 123. From the same.

Note 124. From Naeher, J. Die Burgen in Elsass-Lothringen . Heft 1. p. 25, Pl. 6. Strasburg. 1886.

Standing on a projecting hill, the rock supporting it is s separated by an artificial excavation from the ridge of rock extending behind it. A transverse wall adjoining the rock contains on the northern side the entrance A, through which the way leads to the south, turning again to the north to a gate tower B, from this into a little court C, that lies before a building D, which could be termed the palace, if the ruins a allowed the recognition, that it offered some comfort. Now t the little garrison must first be contented. We do not see many windows in the exterior; they may have opened on the little court C. On the other hand the holes in the masonry show, that a projecting defensive gallery existed and also a wooden bay window. High above this southern portion of the castle r rises the northern wall with a pentagonal tower F, surrounded by a wall G in the form of an irregular hexagon. The tower i itself turns its edge toward the enemy, like that in the angle of the court, i.e., toward the ridge of the hill, on which he could build his casting machines. Meanwhile these casting machines could not do serious injury to the tower or to the wall enclosing it.

The two towers of the Trifels yet standing, the principal tower as well as the square one standing outside the enclosure

have yet no slots, to be regarded as openings for shooting, and if we have assumed such on the dwellings in our restoration in Fig. 37, this is only the subjective opinion, that such might have existed there, since indeed everything must first occur somewhere. Here on castle Ortenberg all parts exhibit slots, so that thus not merely from the battlements and from the defensive galleries, but from nearly all points arrows could be sent against the assailants. Since by their thickness the walls would have hindered the archers, then recesses of considerable size are arranged behind each of the slots.

105. Fortress Landskron.

Of the fortress Landsrkon in the Sundgau near Basel Merian[125] gives a view, that we certainly cannot entirely harmonize with the sketch plan given from Naeher in Fig. 74;[126] for the terraces at the east and west sides are not to be seen in Merian.

Note 125. In Topographia Alsotiae, etc. (See Note 29, p.36)..

Note 126. Naeher, J. Die Burgen in Elsass-Lothringen. Heft 2. p. 11, P. 5. Strasburg. 1886.

The fortress stands on the middle of a ridge of rock on the top of a hill ridge extending lengthwise, on which by great cuts in the rock is formed a ditch, from which rise larger and smaller rocky peaks left standing, the greater again being in two levels. The route of access comes from A. While then Naeher gives at B the ruins of a building in which we see a tower with a gate, and at E another gate, before which stood a bridge, over which led the way from the eastern terrace, Merian gives a bridge at B without a gate, which however must have stood there; for the two half round towers C and D indeed still were only added at the close of the middle ages. Into the inner court leads the gate F under protection of the tower J, adjoined by a building wing H. Through K it then passed into the higher inner court L. A building M with a round stairway tower now occupies the way, which then leads up through it over the flight of steps N to the doorway of the tower O, which still in the old manner lies high above the ground of the castle court. As the palace we must with Naeher recognize the structure P. On the isolated rock at the west side yet stands a terrace Q, that indeed was connected by a bridge with the stairway tower adjoining the main tower O. When Nae-

Naeher designates the east side as the proper side of attack, this is so far correct, in that the ridge of the hill offers more space there for placing machines for attack, and for forming a small siege army; yet doubtless the besiegers would h have attempted to assail the castle also from the west, and therefore the tower Q was of great importance, as in general the architect took entire consideration of the location, when he placed the tower I at the east opposite the rock terrace there like Q against the western. But toward the south the h hill could be climbed, though slowly; therefore the architect also arranged the outwork on the south and led the way through the outwork leading to the terrace at the foot of the rock, in order to make the combination of the enemy more difficult, if he decided to attack at the same time at both east and west. sides. If always remains striking, that the two parts of the rock seem to have remained open so simply in favor of the besiegers at both sides, and the thought cannot be rejected, t that outworks extended still further and enclosed the rock.

Of the construction of the castle, there are no definite statements; it must have been undertaken by the emperor Frederic II in 1215, and probably is the first newly built after that time. In the 17 th century, when progress in artillery made a siege near by entirely superfluous, and there fore a cannonade from the south side was here most probable, it received there also a crownwork, that the hostile artillery must silence. Meantime this could not defend itself against a regular siege, and Frederic V of Baden therefore surrendered the castle in 1664 for an indemnity to the French, who blew it up.

106. Spesburg.

That is only a small but interesting castle, of which we g give the plan in Fig. 76 from a drawing by Winkler, as well as in Fig. 75 an attempt at restoration by him, the Spesburg [127] near Andlau in Alsace.

Note 127. See Naeher, J. Die Burger in Elsoss-Lothringen. Heft 1. p. 30. Pl. 8. Strassburg. 1886.

It stands on the end of a projecting hill, that extends from north to south, on a peak of the rock, that is partly detached from the ridge of the hill by a ditch H. The ditch is manifestly incomplete; for at T a part of the rock is left, evidence

of the fact, that so frequently the construction of certain works continued so long, that men finally considered it no longer worth the trouble to complete them. Toward this ditch, i.e., thus toward the inclined ridge of the hill, is placed the castle tower G and a massive lofty wall, that must both belong to the preceding period. Striking is the height of this wall. To it adjoins the dwelling F with a lower height, which perhaps in its nucleus is also older, but in any case experienced a rebuilding in the second half of the 13 th century, by which the present character of the castle is determined. Whether Winkler's assumption be entirely conclusive, that the building on this side had no visible roof, but descended toward the other side, we do not venture to decide; just as little whether the row of battlements was calculated f for a wooden defensive gallery, that was supported on corbels or on prolonged beams. The wall is opened by windows, that e ensure some comfort to the rooms of the dwelling. The way of access came from the northeast, then in the southeast led through a first forecourt A into a second B, at the sides of which lay two others C and D, and then through a narrow passage at E into the dwelling F. This external plan, of which l little seems to be preserved now, must partially have first been executed at the close of the middle ages. In like manner, but perhaps going down lower on the hill, there were in any case from the beginning, palisades before the structure.[128]

Note 128. From Winkler's drawing.

107. Castle Ehrenfels.

A pretty castle structure of small dimensions meets us in the castle of ehrenfels, that was erected on the bank of the Rhine, on the slope of the hill below Niederwald and opposite the Mouse Tower and Bingen, and that is known to all today who visit the Niederwald monument, but also already since the 17 th century has been frequently reproduced, and whose picturesque ruins in particular none of the illustrators of the Rhine have omitted, so that the number of engravings, lithographs and photographs of this ruin goes into the incredible. But in our knowledge no one besides von Cohausen has published geometrical drawings. From the drawings which this honored friend has left to us, from those drawings which the deceased count Botho von Stolberg-Wernigerode made, and that are now

found in the German National Museum at Nuremberg, as well as the illustrations in Merian and in Daniel Meissner's Libellus novus politicus, [129] we have composed the view that we present in Fig. 77. Certainly it no longer shows the form of the 13 th century, but the rebuilding it suffered in the 14 th and 15 th centuries.

Note 129. In the copy before us the first port beors the t titler-- Sciogrophio cosmico, i.e., New Emblemotic Book, therein eight costles of the most prominent cities, fortresses, costles, etc. of the whole world. Nuremberg. Poul Fürst. 1637:-- the others:-- Libellus Novus politicus Emblemoticum civitotum, pors oltero 1638, tertio 1838, quorto 1638, etc. (Wherein our fortress is given on Ploto 10.

Built in the year 1215, it then received its chief work, a massive wall with a defensive gallery, flanked by two towers, and before this being a rectangular court, that is surrounded by a high wall. This is the peculiar castle of the 13 th century. The mountain wall behind the work was partly removed, so that the space behind it formed a ditch. From Rüdesheim t the way ascended to this ditch. Before the work was an area built in several terraces, whose upper portion adjoining the principal work was enclosed by a not entirely rectangular wall.

On the side next the Rhine, the inner castle for its entire breadth was occupied by a residence with two gables. Toward Rüdesheim was later added the gate as an addition. On the same side from whence the road came, the wall of the upper terrace was extended, and the way into the castle ditch led between two little round towers, then through a gate building into the interior. In the outer angle between the principal building and the projecting structure were added buildings, that were partly constructed of wood in the upper stories, a appearing extraordinarily picturesque in the view in Meissner, yet having nothing to do with the construction of the fortification. Some houses stand behind the enclosure of the wall at the foot of the hill before the entrance to the castle.

Below the castle stood on the bank of the Rhine a strong custom house of the archbishop of Mentz, that was commanded by the castle, and must have been supported by it. The principal workof the castle will be described later.

103. Marienberg.

108. Marienberg.

The greatest of all castles in the West is doubtless the M Marienberg in Prussia, whose entire plan is given at the same scale (1 : 2000) on the adjacent Plate, [130] at which all other castles are drawn. A slight rise on the shore of the Nogat received the highest part of the castle, that otherwise extended along the bank of the river, surrounded by moats, that f formed its strength, since the water of Lake Balauer could be admitted into them, and they were so wide, that even if partly dry at low water, yet wading them was made impossible by the swampy bottom. That a castle of the mighty extent was not built at once is evident, and we already find also from the names of "old" and "new" castle, that certain parts bear, that they were not erected at the same time; meanwhile the entire plan again shows, that only little can have been added in the later time, that was not intended from the beginning. The commencement of the castle goes back into the middle of the 13 th century; yet those buildings can scarcely come into consideration. First in 1276, when the city of Marienburg was f founded , the castle of the order was also erected on the site now occupied by the old castle. Whether already then, since the Starkenberg had already fallen in 1271, the idea already appeared, that the wars in the Holy Land were now coming to an end, that the order must now take its seat in Prussia, and that Marienburg was the most suitable place for the centre of the order, indeed can scarcely be proved with certainty, but is entirely probable. But first in the year 1309, when t the seat of the grand master, which was removed from Acre to Venice in 1292, was transferred from Venice here, could the plan proceed to execution, to build here a castle of such extent, that the main army of the order could be united at the seat of the grand master; then only for a great garrison could a castle of such extent be necessary, not for the dignitaries of the order united here. It must indeed be assumed, that not in 1276, as for so many buildings of the order, was it erected of wood and earth as a definite castle, but that already then the actual construction of the existing main castle began, if certainly the order also first ensured the site, on which it desired to erect its castle, first by temporary works for the permanence of the building.

Note 130. Castle Marienburg in Prussia. Represented by its finest external and internal views. Published by F. Frick. Berlin. 1799. 19 plates in aquatint. Drawings made by Gilly and Rabe.

Historische und architektonische Erläuterungen der Prospecte des Schloss Marienburg in Preussen. Published by F. Frick. Berlin. 1802.

The castle consists of three main parts, that certainly in the year 1309 were so planned, as they are executed, but only gradually could they be completed, since the most important, the nucleus of the work, naturally came to execution first, the outer works being last. As the innermost part, as nucleus of the whole, appears the old or main castle (III of our plan). Before this and dominated by it extends a forecourt, that is surrounded by buildings; the new or middle castle II, before which is also a widely extending rectangular wall, that encloses a very extensive court I; the lower castle. In any case the main court must have been completed soon after 1309; for the church incontestably as it now appears was not contained in the original plan, and had received its eastern part Z during the thirties of the 14 th century.

Located on the bank of the Nogat, the castle had its main entrance from the side at A, where a bridge led over the Nogat, at whose opposite end lay an outwork, and the water gate opened, protected by two round towers. From the plan of this gate, ar well as the fact, that the area along the shore was designated in old times as an enclosure, it comes that a wall was found at the bank, that allowed a defense of this front area. The elevated site of the bridge did not however permit a landing from boats at this place; therefore since men did not wish to prevent communication with the castle by water, a small portion of the shore was left outside the enclosure, and at B under the protection of a tower was constructed a second entrance to the area. Behind this tower B a bridge leads over the outer moat to the gate C, the armor gate and the Lorenz tower (so-called from the adjoining Lorenz church D), into the lower castle, i.e., into the great court surrounded by walls and towers. At the end of the wall around the front enclosure, where the outflow into the Nogat must occur; still stands a round tower, that indeed formerly stood entirely in

in the water, the "leaning or buttermilk" tower T, but which as it appears, was only built 100 years later (1412). Doubtless in the wall of the front enclosure other towers were built or intended, ar corresponding to the great distances at w which the towers of the enclosing wall of the Marienburg stand, we have indicated by dotted lines in our plan. [131] Likewise the northwest side of the castle court I no longer shows any towers, so that we have also indicated such by dotted lines.

Note 131. In Vincennes the distance apart is still greater. (Fig. 63, p. 120). This greatest castle court has in its interior a series of certainly low buildings of different kinds, in which were indeed placed men and horses in great number as in a camp, buildings whose arrangement perhaps was entirely like a Roman camp, and that we can conceive erected so as to be easily destroyed, for the army consisted of soldiers, w whose fidelity could not always be counted upon, and under some circumstances men had to fear, that the castle must be defended against them, so that not in their barracks should they find too strong a support for their revolt. Later may c certain buildings have been erected monumentally. With the o original purpose of the castle ceased the old arrangement; b buildings arose and disappeared.

The plan by Rabe allows some things to appear, of which those hatched in our plan still go back to the earlier time, b but those dotted are of later origin. Opposite the armor gate lies a second gate, the carved gate, likewise between two square towers. From its existence we conclude, that the enclosure found at this side, of which it is known, that its outer walls and towers were first erected after the siege of 1410, must have previously existed in a similar way; for the carved gate only leads into this enclosure. If it must provide for actual passage outside, then would men not have obstructed it by the enclosure. Whether the southwest end of this enclosure already then took the form, that it had later, seems more than doubtful. Then indeed to the tower K, that must have existed, must have corresponded the tower L, as well as a second located outside. A wet ditch inside the enclosure extends around the entire structure; a second of unusual width lies on the east and north sides before the enclosure in order to make it just as inaccessible as possible, ar the Vogat did this on

the northwest side. It bore the name of the master's carp pond. Perhaps we must assume before the problem, which this fortified camp had to fulfil, that the erection of the entire monumental wall of the lower castle was long delayed, and for a long time an earth wall with wooden enclosure remained standing, perhaps till the close of the 14 th century, so that the construction of the front area after 1410 and that of the buttermilk tower in 1412, as proved by documents, were even merely the produced termination of the entire castle, planned after 1309 or even in 1276. This lower portion of the Marienburg has in regard to purpose and plan its parallel in the castle at Vincennes,[132] that was also a strong camp for a great army at that time, which would be led into the field, as likewise the order in 1410 first went out to oppose the Poles in the battle near Tannenberg, and then after the first battle had to defend themselves in the fortress and to hold it. But in Vincennes the design is relatively small, so that it could be defended by a few men against the rather mutinous soldiers, since even there only dwelt a royal commander. Here was the chief commander himself, the grand master with all the officers and the entire order, who must find suitably shelter in a work, that in case of soldiers housed in the lower camp of the castle mutinying or attacking it, it might be defended without a great number of men by the knights themselves. This purpose was served by the castle proper.

132. See Art. 96, p. 120.

Consisting of two parts, the middle or new castle II and the old or high castle III, it lies at the southwest angle of the entire structure, so that court I continues around the east side of these main buildings, and a wet ditch in connection with the main moat encloses this castle inside the court. Over the ditch at the northeast corner a bridge D leads to a gate structure, and at E through the building into the court; an enclosure with towers encloses the middle court on the northeast and southeast. The southwest angle projects into the ditch; there is the most ornamental portion, the grand master's residence, erected by Weirich von Kniprode (1351-1382), who extended and completed the work of Dietrich von Altenburg in this part. This will be fully treated later. On the northeast and southeast also protected by a separate enclosure, of

which we must also call attention to the tower at the south angle, the priest's tower, the middle castle is entirely open on the fourth side, and is separated from the high castle by a ditch, that indeed is now dry, but which placed between the others, in our opinion must originally have also been so deep, that it had water. Beside the grand master's residence a bridge leads over it to the gate F, from which the entrance led obliquely toward G into the inner court of the old or high castle III. This was made approximately square, and was surrounded by a second enclosure now interrupted by the church. Outside the enclosure the tower H stands in the ditch, and w which is connected with the upper story of the main building by a defensive gallery resting on arches. Similar towers occur here and there on buildings of the Teutonic order, and bear the name of "Danzger." Their model may be the tower of the fortress Starkenberg, although we have older similar ones in Germany as at Trifels. The appellation of "Danzger" is certainly first proved for buildings of the Prussian order.[133] T The plan of such a tower had the great value, that every outwork has, and by the connection with the main castle also the advantage, that on either side of it were sufficient men, and that these could easily retreat into the main building, after the tower had fallen. First of all the men in the defensive gallery could easily hinder the approach of an enemy on both sides of the main building by casting stones and arrows at t the enemy, particularly since the crossbow permitted a more certain and stronger shot. Therefore Kohler believes, that before Dietrich von Altenburg caused the church building to project from the high castle, the priest's tower by which our Danzger F lying diagonally opposite the angle of the high castle were also connected by an oblique defensive gallery like the latter, so that by it the two other sides of the high castle were also protected, an assumption which at least has grounds of suitability for itself, even if already the passage must be rather long, and also no proof is brought. If one must assume so many other hypotheses, certainly they must correspond to this of value. But our Danzger F also still has the problem to protect the arrangements made for water in the ditches of the high castle.

Note 133. According to Köhler (Vol. 2, p. 452) the name must

first have been derived from the "Stock" tower erected at Danzig in 1380, which stood before the high gate.

These are also still partly preserved. Not at all times could the inflow of water be the same; for low water must therefore be arrangements made, that the water could be kept in t the most important places, then flowing into the other ditches when the small area to which it was restricted by dams was f filled and overflowed. As innermost of these ditches to be f filled under all circumstances appears a line around the enclosure of the high castle, which was enclosed by a wall built in the ditch, at one side adjoining the priest's tower, then the Danzger H and on the other side the grand master's residence, and if it was but a few yards wide, yet at least surrounded the entire high castle with water, if the other ditches were dry. But also when all ditches were filled by water flowing over this wall or by opened sluices, this formed under t the surface of the water a very valuable obstruction to an a approach by canoes to the wall of the enclosure. The plans of Rabe at our disposal show even only remains of these walls, which we have restored on our plan, where indeed every starting point is lacking to us for determining how the water was let into these innermost ditches. A second line of such dams must have resulted, by the wall with towers also in connection with the Danzger, that secured the castle against the city, stood in the water, and indeed at the bridge of the prior gate likewise existed a connection, so that if the water did not suffice for all ditches, yet the ditch around the middle and high castles could be filled, while only if the water sufficed the ditches and the low castle and the city could be filled. The city itself, its enclosure well fortified after 1280, was entirely open toward the castle; the direct connection only passed from the enclosure through the gate at D, that formed one of the gates of the city under the name of the "Shoe" gate. Köhler also mentions a connection, that led on a bridge away from the high castle to one of the towers, passed to the Dietrich tower, and thence led into the city. Under king Frederic II, first in 1774 was constructed a corresponding entrance direct from the city into the high castle. The city itself f formed at the south an outwork of the castle; under Weirich von Kniprode, it was extended by enclosing the new city somm-

settled before the gates, so that the entire combination of castle and city had an imposing extent at the beginning of t the 15 th century, at the time of the climax of the order. T This highest period certainly did not last long. The battle at Grünwalde-Tannenberg broke the power of the order; his o own unpaid soldiers in 1457 held the grand master a prisoner in the castle and gave him up to the Poles for a reward, in whose hands it also remained at the conclusion of peace in 1466. City and castle were in possession of the Poles, who long regarded it as their best fortress, until it fell to Prussia in 1772.

109. Carlstein.

When the emperor Charles IV in the years 1348-1357, leaving his capital, erected on the ridge of a hill a castle of considerable extent, as he did in his Carlstein (Fig. 78),[134] this did not have the purpose of protecting the country, nor even to hold it in subordination, but exclusively that of affording the emperor a secure residence, where withdrawn from the world, he could live exclusively for himself, indulging in the monotony of his reflections, but also could safely and properly at the same time preserve the treasures, that he had collected. That the castle should comprise a great garrison did not lie in the views of the builder; rather should it appear externally as an ornamental work and a casket of treasures.

Note 134. From Mitth. d. K. K. Cent. Comm. für Baudenkmale. Vol. 7. p. 75.

Extending from west to east, the castle was built on a crescent-shaped terrace, that attains its greatest height at the east; rugged and steeply falls the rock on all sides; through its foot at the northeast point is the road cut, which leads to the front entrance gate, the tower A, adjoined by a guard house C, while on the south side a wall with a tower goes higher up the hill to the terrace D. To the enclosures the way n now rises from A to a second gate tower E, adjoined by the b buildings F and G. Passing through the latter one reaches the lowest castle court I, that includes the building H at the w west, but at the east is a massive retaining wall, that encloses the second court II. This leads to the palace K, in which the emperor located his living apartments, adjoining it being at L living rooms for the monastic clergy, at M a stairway t

that connects together the different stories of the palace -- of which there are five. From this stairway also goes a bridge to the main tower N, which stands on the terrace III, only a accessible by a flight of steps. The tower now has but three stories, the uppermost of which forms the chapel, from which the building is now designated as the collegiate Church of S. Mariae Virgin. In the story beneath the chapel are found living rooms; the walls are therefore opened by windows, just as in the chapel story itself; in these are formed the stairs. In the uppermost story is still found in one corner a chapel-like treasure chamber; in brief the walls are very much weakened, so that since the defensive platform and gallery are wanting, the building now no longer appears at all as the principal tower of the fortress.

The terrace IV rises yet higher than III; it is enclosed by walls with defensive galleries and four towers O, P, Q, R. T The tower O, to which one ascends by means of a ramp from the court III, contains the entrance gate to this terrace, on which stands a second main tower S, to whose entrance, before which was formerly arranged a drawbridge, leads a flight of steps attached to the wall O P. This tower has on the terrace three vaulted, and over these two stories without vaults; above which was first found the defensive gallery, here quite reduced. The walls of this tower are even somewhat thicker than those of the first, but likewise already from below upward are opened by windows, so that thus the fortress character is greatly softened; also here are arranged stairs in the walls. The middle main story is the chapel of Holy Cross. The mass of the tower in its horizontal extent, the enclosure by walls and towers vividly recall similar buildings of the crusaders, and it is entirely probably, that the emperor intended such.

Our description of the plan of the castle we have yet to c complete by a mention of the western end, where a wing V and a semicircular closed tower W stand, wherein was found the w well, then by reference to the enclosure, that extends at a right angle along the southwest and southeast sides.

The plan exhibits as a special peculiarity the existence of two main towers N. and S, for which no reason as fortification is evident. If we examine these two towers of the castle

in place, we cannot escape this, that in each tower the chapel evidently forms the principal room, which also agrees with other castle towers, and since it was desired to have two such chapels, two towers were also erected. But that Charles needed two chapels proceeds from the abundance of treasures that he had to preserve, among which the relics and insignia of t the Roman empire on the one hand and those of the kingdom of Bohemia on the other, formed two separate groups, each sufficiently prominent to form the treasure of its own chapel. If the emperor had for the service of the Maria chapel had formed a chapter, that consisted of a dean, 4 canons and 5 choristers, and at the same time had formed the purpose, that on the altar of Holy Cross chapel besides the dean of Carlstein, only bishops should read the mass, this also shows, what high esteem and what importance he arrtibuted to these chapels.

What heretofore made Carlstein famous was the luxury, which prevailed in the splendid equipment, and that yet remains in certain chapels, particularly the Holy Cross chapel, to d describe which will be our problem in another place. Also the costliness of the treatment of the chapels shows, that for t them was erected the castle. It is interesting to find, that the oversight of the castle was given to a burgrave, and 20 soldiers composed the garrison, while 22 vassals of surrounding estates had to appear in case of danger for the defense of the castle.

Thus there was no great garrison, even if we assume, that when the emperor with his attendants was present, to which the defense of the castle was committed. They even had no military problem; they were there only to keep robbers from the treasures, that the castle enclosed.

On the details of the meansures for defense we are not instructed; for the castle always remained habitable and so never needed what existed in defensive galleries, bays, etc., a and thus in the course of time and finally even in our century were these gradually removed; even forms of roofs, that w- were by little peculiar, must give way, and only tradition k knows what to say of them. Whoever has before his eyes, as j just at the time when the castle was erected, the Holy Grail and its castle Mons Salvatoris with its knights formed the i ideal of knightly and social circles, will easily allow him-

himself to be convinced, that also Christians thought of the Grail, and would erect a similar church for his sanctuaries, (for the chief part of his treasures consisted of relics, and also in the imperial sanctuaries the relics were regarded as the chief part, and the regalia like the imperial crown, even acquired its sanctity in being preserved with the relics), a and that should pass as a sanctuary together with its knights. Then we must assume, that also the exterior of the Carlstein was furnished with these galleries and turrets, and showed t those bay windows and pointed roofs, which already the poets boast of for every castle. And if aoso to judge from the simplicity of the lower architecture, the effect depended only on the entire form, and that actually a sacred earnestness characterized this castle of relics, then can we think of the general appearance as not capricious. The view of the castle must remove every frivolous idea from one approaching; its sanctity must protect it more than the small garrison. In fact it would have been an ingury to expose it with its splendors to the danger of a siege. It was an ideal castle, no war castle; so much the more is it also indeed an injury, that by unworthy treatment it has come down lower, than if it had been stormed a dozen times.

110. Castle Vayda-Hunyad.

A very ornamental castle in a different sense, but which also shows only, that the warlike importance of castles was already then reduced more and more, is the Castle Vayda-Hunyad in Siebenbürgen. Likewise this castle may have been already fortified in the earlier time, like many other later ones. T Thus as it shows in the remains, it belongs to the close of the 14 th and partly to the 15 th century. We give in Fig. 79 the plan and add in the adjacent plate an elevation of the w west side, from the drawings that the students of the Vienna Academy made under von Schmidt's direction, published in the plates of the "Bauhütte", where the elevation may also be regarded as an attempt at restoration.[35]

Note 135. From the illustrations of the "Wiener Bauhütte.

Corresponding to the form of the low hill terrace, that falls from south to north and then passes into the valley, various buildings are grouped about an irregular court, of which at once the palace or hall structure is the most important,

as appearing to us, on account of which the entire castle was erected, that otherwise is to be termed a court or festal castle. The palace stands in the middle of the enclosing buildings, whose most ornamental part forms its western facade; it is therefore similar to that of Pierrefonds (in contrast to those earlier ones of the 12 th century, that stood defenceless in the castle, and for which therefore an inaccessible location is sought, free from storm), is desired for defense. North of the palace and not higher than it stands the entrance tower with bay windows, from which the tower could be defended from that over the entrance gate. Four round towers at different sides strengthen the enclosing wall, that is everywhere formed by the outer walls of the buildings, that lie on the separate terraces, particularly a larger one at the n northeast angle. Among the structures is the interesting chapel. Unless the terraces are so regarded, there exist no outworks. Only at the south side, where the hill terrace is considerably higher, and where suitable space existed for the p preparation of machines for attack, stands a strong square t tower, separated by a cut in the rock, whose upper story projects on corbels and encloses the defensive platform. This t tower is connected by a defensive passage with the castle itself, that passes over a high wall, that is partly supported by the ground rising behind it. If this defensive passage were not to be quickly taken by the enemy occupying the terrace, then at least an enclosure of palisades or considerable length was necessary. Only if one assumes this is it comprehensible, that in this retaining wall is arranged an opening, by which a connection of the upper terrace with the river becomes possible, which in case of a siege must only facilitate for the enemy the connection between its men operating on the east and west sides of the wall, even if the opening were dominated from the upper defensive passage and from the outer wall of the castle. For the defense it could only fulfil the same purpose, so long as the defenders could still act outside of the castle; while this was the case, it formed the connection of the sally port on the east side with the river valley, to which one could not pass from the main entrance, since the b bridge lying before it led over the little river to the other side of the valley. Of the details of the defensive gallery

on the palace is especially interesting, as well on account of the practical use, since it is lighter as a corridor for the guests in the hall, than suited as a space for the defenders, as well as by the ornamental treatment, that is to be regarded as the chief thing; for on account of this man have evidently omitted to arrange slots as shot holes, and have b built great windows, behind which the defense must stand as unprotected, as at slots not provided with battlements.

111. Castles of the 15 th Century.

Building, strengthening, destruction, restoration and rebuilding continually succeed each other in our castles in Germany. Each period retained of what originated previously; what it believed it could use, and added improvements that it was able to manage. Thus for most of the castles the appearance, in which they have come to us, is indeed extremely picturesque; yet it requires for most a critical analysis to determine to what time each part belongs, and careful consideration how such a castle was created at each of the different times, of which it contains details. We have already (Art. 41, p. 42) said, that each castle is individual, and therefore have omitted to establish too many general principles in castle architecture. We have preferred to place a series of such individuals before the eyes of the studious reader, who will recognize by their examination, how difficult it is to discover the definite rules that were employed, and how simple if one will entirely abstract them, how brief the formula must become in which one can express them. One can properly only say, that men constantly endeavored to study as thoroughly as possible the conditions of the separate case, and to do what resulted from the location itself. But always till the close of the 1 14 th century only existed the necessity to ensure against storm, that brought man to man, and where the besieger was to send a greater number of men into the field, than the besieged. The latter therefore desired from a safe place to injure the enemy on the march to the castle; he wished to make it impossible for the enemy to take a fixed stand in a suitable place in the vicinity, and to be able to develop his strategy. He desired to make it impossible for the enemy to be able to attack the entire enclosure of the castle on all sides at the same time with his superior army; even if the besieged had

not as many men at command, to be able also to defend the entire enclosure at the same time.

The means of attack possessed by the besieger indeed until this time were all calculated for acting in the vicinity. Also machines existed, by means of which the besieger could cast great stones, beams, etc., to a considerable distance, but their use was difficult and the aim uncertain; the defender could easily from his elevated point destroy the machines of the besieger by similar ones, that he placed on his defensive platforms, when they were in condition to injure the castle materially. One can almost state, that it was more important for them to throw stinkpots into the castle, and thereby make stay therein difficult, or even impossible, than to cause the walls to fall by shots. For this the chief means always remained to undermine the walls, and we know that the Mohammedans attacked the castles of the crusaders by just great works of this kind. Where this was impossible on account of the high location on the rock, where the besieger could not succeed in coming on the wall of the castle by a movable wooden tower, where a weakness was nowhere to be found, the bold men could not be utilized to climb the rock and walls at a point not considered by the defender, and to be able to penetrate into the castle, then in spite of his superior men nothing remained to the besieger but to blockade the castle till treason, despondency or hunger opened the gates. Therefore we also see how carefully men avoided placing openings for windows in walls and towers, in order to not afford opportunity to the enemy to enter there by force or craft. One must see, that every window opening, that was not absolutely inaccessible, must be constantly watched by the defenders and occupied by men, if it should not give opportunity for a catastrophe.

In the little German rock-nests of the 12 th century it was always concerned, that they must be defended by very few men. Therefore first of all the inaccessibility of most sites was primarily the object, while these measures for defense stood only as second. When therefore for example, Viollet-le-Duc[136] shows what importance projecting towers have for the defense of a wall, and then makes assertions that the German castles before the 14 th and 15 th centuries did not have these at all, that thus their measures for defense were bad, they we

ask very simply, what one of the little German castles would have used such towers, if there were no men to defend them? But also the attacking army, that could be set in motion for the siege of such a castle, was so small, that two men of the garrison could also defend themselves without their towers. The castles thus in regard to their problem of defensibility were not inferior to the French, that had quite a different problem. There is found among the French and English no element, which men did not also know at the same time in Germany, and where it was necessary, also employed it. Yet then indeed knightly society was always in movement, the lord of a castle, who had not seen the world and sought adventure, who did not know the castles of foreigners together with those of his native land, who at least at his own castle, or at the court of the nearest prince, had heard widely traveled knights and wandering singers of all nations narrate, how castles appeared elsewhere, is indeed entirely inconceivable!

If we thus see what progress the fortification of castles had made in the East, we find that all of this resulted from the employment of great numbers of men for the defense. The doubled defensive galleries, the slots in the verticals of the battlements, the different rows of slots for shooting in the walls and towers, in order to cast a hail of arrows on the enemy, all had reason only if men were there to occupy them. But these were lacking in the German castles, and so men held it most appropriate for a long time, simply to remain in the old security of the mouse-trap.

A change in this first resulted, when with the beginning of the 15 th century cannon had taken such a development, that they could become seriously effective against the walls and towers of castles. The report on the destruction of castle Tannenberg (Hesse) in the year 1399 shows, that in spite of the clumsiness of the cannon, not yet overcome, still a castle could be destroyed from some distance. The farther we advance in the 15 th century, so much the more effective became the guns. For the castles themselves it was already a question of the existence of each castle, whether it was possible to have not merely muskets instead of crossbows behind the slots, but also cannon, that dominated the entire vicinity so far, that by their effect it became impossible for any enemy

to be able to plant his cannon so near the castle, that he c could thereby hit and destroy its walls. Not every lord of a castle could manage this, and then already most of the castles must fall, unless the stopping of the guns of the besiegers if seriously effective, and that in the mountains effective guns were scarcely to be used, so that inaccessible castles could yet for a time dispense with guns for defense. But where in particular the cities in war against the nobility brought their great cannon before the castles, that were not similarly equipped, then the castles soon fell. What lord of a castle that only could, sought to secure himself by the possession and mounting of guns, so that he was in condition to prevent the erection of batteries in the vicinity of the castle, that might injure him.

Note 136. Viollet-le-Duc. Vol. 3. p. 105.

112. Hochkönigsburg.

We must for such a castle again select an example from Alsace, whose greatest and most famous, the Hochkönigsburg near Schlettstadt, we presented in plan in Fig. 80 to the reader.[137]

Note 137. From Viollet-le-Duc. Vol. 2. p. 168 et sec. -- K Kocher, J. Die Burgen in Elsass-Lothringen. Heft 1. p. 30, Pl. 9. Strasburg. 1886.

On the ridge of a hill sloping from east to west, that in the middle bears a high rock, rises the fortress. Originally indeed limited to the rock mentioned, there already in early time stood there a fortress, that was taken and destroyed in 1462, and in 1479 by emperor Frederic was transferred to counts Oswald and William von Thierstern, who immediately commenced rebuilding, for which they again used certain remains of the old building, so far as these appeared suitable. In the year 1633 the fortress was cannonaded by the Swedes, partly destroyed and burned.

On the west side from which it was most accessible, and from which the chief attack was to be expected, it is separated by a ditch from the rest of the ridge of the hill; then the entire terrace including this ditch is surrounded by a low e enclosing wall with semicircular towers, which are still connected with an outwork T, that lies lower on the front ridge of the hill. At the southwest ascends the road to a gate A, from which branches to the right the way into the enclosure

and the outwork, reaching an external work, which is enclosed by two towers P and S like bastions. In this it rises to a s second and higher gate B, passing through which and turning at C, it attains the famous lions' gate D, then past a building G by two gates into the wing I, that is open below toward the castle court K. On the highest point of the latter stands at H the old castle tower, adjoined by another building L. At V stands the great and remarkable constructed palace, to which is also joined a parallel structure. By a ditch N [138] this p part of the terrace is separated from the western outwork, t that is terminated by two low round towers P and Q. These towers are of almost solid masonry and have in the interiors rooms like casemates, in which stand cannon, that could sweep the intended points. On the towers were platforms bearing guns, that could be directed toward all sides. They had the problem to make it impossible, that either on the western ridge of t the hill, in the valleys at the south and north, or on the o opposite heights cannon could be placed, to fire on the castle. In this problem they were aided by the two semicircular towers R and S of the east side, that lay substantially lower. The palace had a massive construction, that could resist cannon balls, and it bore a platform above, on which could also be placed guns. Also the outwork T should receive cannon behind its walls. The defensive galleries of the inner and outer walls extending around at different heights partly project as corbels, so that they were wide enough and offered a convenient passage, behind whose protection covered with wood, men with muskets and crossbows could stand. In the semicircular towers great calivers and small guns found places.

Note 138. This ditch indeed formerly was the western end of the earlier castle, that must have had its outworks at the east at S. and R.

But also at this fortress there must have been a garrison of considerable strength, about 500 men, for whom shelter must be required. Since this could not be the case in the inner castle, then indeed wooden buildings were erected in both outworks, and besides the towers had simple rooms, in which men could live.

The well served batteries around the castle on all sides m must have protected it naturally; particularly they could be

extremely effective, where it was only the entrances to the castle that required special defense, and so we see that to an active series of castles of the earlier time were added s similar bastions.

113. Castle Fleckenstein.

Castle Fleckenstein in Alsace, that we treated in Art. 66, (p. 75) with the addition of a plan, was subjected to a rebuilding in the 15 th century. If one assumes, that theck walls could resist the effect of cannon, then this must avail in a yet higher degree for a mass of rock, that had the strength of Fleckenstein, whose horizontal section is given in Fig. 35, and so was well worth while to increase it by buildings and to enlarge it. This occurred in the manner to be seen from Fig. 32. [139]

Note 139. From the drawings of provincial architect retired Winkler in Colmar. -- Also see Koeher, J. Die Burgen in Elsass-Lothringen. Heft 1. p. 13, Pl. 1. Strasburg. 1886.

First at the south side, where the rock had a recess N, a retaining wall was added between two bastion towers L and M, then on the narrow terrace was placed a series of buildings, that served better for occupation by the garrison, than the chambers cut deep in the rock, that appear in Fig. 35. The m most important of these are designated by I, which are attached to the rock wall, rise from the lower terrace and enclose the wall marked by S in Fig. 35, and that receives a winding stairway of considerable width. The other buildings stand above on the terrace of the rock. Among these is arranged the bastion marked P. Certain not monumental structures R, which have left their vestiges in different places, need no mention here. Indeed mary of these may have also existed in other places. But of a certain importance is the partly doubled wall, placed before the north front of the rock, which defends the road of access, that indeed already followed the same curved ascent as still now. A lower court A with a ditch at the north is a round tower, at the south being a square bastion, connected with the higher of the two walls. Between the two stands a gate behind the ditch. A bastion arranged for cannon is also the square gate building C. East of the same also stood a little tower D, which Winkler represents as rectangular in his drawing, yet in his attempt at restoration, that We repro-

reproduce in Fig. 81, it is shown as round. As Winkler assumes, the fortress may have appeared also in the beginning of the 16 th century, which on its rock will not merely pass as unacceptable, but just be regarded as a marvel.

Master Speckle indeed may have exaggerated, when in this t theory of fortress construction [140] for buildings on rocks he came to speak of those he had designed differently, first according to the shape of the rock, of which No. 7 has indeed become famous. It would be more than a conjecture to wish to decide that this Fig. should represent the Fleckenstein, and also that he says no word of that. But when Merian published his Topographia Alsatiae, etc., and collected the material f from all sides, it appeared to him then, that he had to present Speckle's ideal design as a representation of Fleckenstein; he had seen the fewest things himself, that he published, and gave it out in good faith as a view of Fleckenstein, and then in the imaginations of thousands and more, who had never seen it, Fleckenstein became the great wonder. Winkler has w won real merit, in that he has made plans and views, [141] that show Fleckenstein as it is and was.

Note 140. Architecturo von Vestungen. How they are built in our time in cities, castles and enclosures, on water, land, hill and valley. By Daniel Speckle, architect appointed by t the city of Strasburg. Strasburg. 1589.

Note 141. Winkler has drawn a number of Alsatian castles a and autographically reproduced them with attempts at restorations, yet unfortunately has only distributed them to friends, and has not allowed them to be published.

But also the impregnability was imaginary, and when the French came in 1674, they succeeded in surprising the fortress, and Monclar laid it in ashes.

114. Castles of the 16 th Century.

It now required greater means to furnish a castle with the necessary guns with artillerists and men, and even the result was the more doubtful, since also great armies were now formed, which marched before the castle with excellent siege artillery, fought to place it, sent balls against the walls and the defensive galleries, towers and bay windows, threw balls upwards from their mortars, which fell and broke through roofs and vaults, and thus the castle into which fire could easily

be cast, was so destroyed, that scarcely anything further remained for stormers to do, than to conquer the heaps of ruins.

How men by further definite works endeavored to give greater strength to the castles, falls outside the limits of our consideration.

Likewise the fortifying of cities must also pass through t this transformation in the 16 th century. But if they could also obtain this, the castles could not. With the close of t the 15 th century their importance had entirely come to an e end, and still since even the knowledge of this fact did not so rapidly permeate all circles, men did not cease to prize and to fear the castles. Whether they were now enthroned above a city, whether in a forgotten corner of the mountains, t they indeed still temporarily made more difficult the use of a road; they could yet compel a siege and festruction, so that the enemy was halted and required to transport heavy siege g guns with the expenditure of force and means.

But to the rural nobility, to the possessors of the numerous little castles, could no longer accrue any benefit from this problem. For this purpose they no longer had any reason to build and to maintain such, to garrison them with men and to defend them. The close of the 15 th and the beginning of the 16 th centuries is the tome in which the contest between the rural nobility, that meantime in the lack of other sources of help had become robber nobles, and the cities came to the decision, which had as a result the destruction of many a beautiful castle. But where the nobles were in friendship with their neighbors, and desired to live in peace with all the w world, there the need became ever more pressing to live pleasantly in the castle, and while the poor noble sighed and complained of the dreary rooms, that this castle offered for living, the wealthy one expended his means in transforming the castle into the most comfortable residence possible. But both allowed the fortifications to fall into ruins; at most from custom and in [illegible] they were occasionally still repaired, and a few men were retained therein, because it was once so arranged.

115. Castle Eltz.

Scarcely can be conceived a more beautiful example of such a castle made habitable at the end of the 15 th century, than

the extremely picturesque castle Eltz in the Moselle region and in the Eltz valley.

Note 142. Bock, F. Rheinlands Baudenkmale des Mittelalters. Series 3. Cologne and Neuss.

Enclosed by the little river of the same name on three sides, it lies on the not very high ridge of a hill, and encloses a court, on one of whose sides lie the buildings in a straight line, adjoining which at both ends the opposite series are arranged in crescent form. The southwest angle is formed by a tower of square plan, that still belongs to the close of the 12 th century, and at the time when the castle was fortified, dominated the entrance [143] lying beside it, just like the tower at Friesach, with which it also has in common, that as shown by the different windows, already in the 12 th century must have had a rather comfortable residence in its upper rooms. It takes the name of Platt-Eltz, from which it has rightly been concluded, that indeed in earlier times its upper defensive platform surrounded by battlements indeed lacked t the protection of a roof. It has several vaulted stories; but in a striking way a cornice seems to have been placed just b beneath the platform. On our Fig. 83 [144] it is visible with its accompanying stairway tower at the right hand of the observer, covered by a pointed roof and opened by windows, which show the forms of the close of the middle ages; for this tower was the proper possession of one of the lines of the house of the counts of Eltz.

Note 143. It is now placed at the opposite end.

Note 144. From Bock.

To a second line belonged the great buildings separated by a court from Platt-Eltz, that are visible farther left on our drawing, having 3 bay windows on the roof, and belonged to t the family Eltz-Rübenach. This building also perhaps had an earlier predecessor, thus as it appears, it may have been built in the beginning of the 15 th century, rebuilt at its close: still it indeed has a defensive gallery at its upper part; but storming this would scarcely have presented any difficulties at the end of the 15 th century, even without artillery. But indeed according to the views of that time right comfortable rooms were in it, to whose pleasantness certainly the b beautiful outlook did not least belong. We conjecture that a

already in the 12 th century the palace and kemnate stood here; for if to us also the building does not appear free from storming, yet it could indeed be protected by an enclosure, since always located at the best place, it would be first secune f from direct attack.

The opposite crescent side an any case corresponds in its outer enclosing walls to the former line of the castle wall. We reproduce it in Fig. 84. It is externally already recognized as consistiug of several parts. The three chief parts, t taken from the right side of the observer, belonged to the f family Eltz-Rodendorf, that again divided into several branches, of which Gross. and Klein-Rodendorf appear to have rebuilt their portion entirely new at the close of the 15 th century, as men even then also built dwellings in the city; story rising above story, opened by windows, yet without any attempt to take into account military architecture. For the uppermost story on the building at the right of the observer r recalls only still a defensive gallery. The part left from t the observer, Eltz-Kempenich, was first rebuilt after the middle ages.

Already the fact, that the castle was not combined in one hand, but lay in the hands of different owners, allows it to appear perceptible, that for the fortification, that still m must have been made at the common cost, nothing more was done quite early, and that it disappeared with small remains. What may be seen of smaller external buildings on our drawing is in great part modern.

116. Joint Inneritance.

Here the owners of the castle at least belonged to one family, but this was not always the case. Joint inneritance (thus was termed the possession of portions of a castle) continued after generations had passed away since the division, no longer personally at all, avd they were connected together only by the common rights and duties of joint ownership. Thus it came, that in the time of feud a joint heir "rejected" the nearest city and captured its merchants with goods on the road, so that the city was compelled to undertake a campaign against the castle, but in which all operations must be carefully limited to the portion of the castle belonging to the enemy, with which it lived in regularly declared feud. But had it stormed

the part of the castle belonging to its enemy, yet he could always escape through the portion of another joint heir.

So far as princes and nobles had retained castles in cities, they could also according to the condition of affairs change these into a peaceful palace or into a great army camp, or even into both combined. The palace at the close of the 15 th century was mostly small, and first the 16 th and 17 th centuries added spacious buildings to it.

117. Castle at Trient.

Thus we give in Fig. 85 [145] the plan of the palace of the prince bishop of Trient, that lies on an eminence not far from the bank of the Etsch at the east end of the city, was rebuilt at the close of the 15 th century, and was enlarged in the 16 th by special additions.

Note 145. From Mitt. d. K. K. Cent. Comm. f. Baud. Vol. 4, p. 10..

A ditch X cut in the rock runs behind the palace; the city wall T adjoins at both sides; the parts marked G are added to the palace. The oldest portion of it is the lofty projecting round tower C, adjoined by a tower B, next this again being a small trapezoidal court surrounded by porticos, with an oblique wing at its south side. This portion to the court D is executed in rich and decorative Venetian ornamental architecture, recalling the palaces of the city of lagoons; only the crowning battlements, which can no longer correspond to any practical importance, remind us, that it was formerly a strong castle, that stood here. But since also the former one was e erected in this modest extent, the successor of the builder added the Renaissance palace A with the two wings F and F, c connected with the old structure by the little wing at D. The part G of the wall, the tower of the eagle gate H, and the w wall tower L were joined, and so originated one of the most charming residences, whose forecourt next the city indeed is still enclosed by a defensive wall M with semicircular bastion towers, so that it was still protected against any revolt, that might arise in the city.

118. Castle at Milan.

The beginning of the later military architecture characterizes the castle at Milan, of whose condition Viollet-le-Duc [146] gives a clear idea, how it was erected at the close of the m

middle ages. Here was created the space for a great garrison, that did not provide for a comfortable life, but had to undertake exclusively military service, so that here also the entire emphasis was placed on the security and strength of the work. If this is not completely attained, that reason lies o only in this, that again the walls and towers must offer resistance to the attack of artillery.

Note 146. Viollet-le-Duc. Vol. 1. p. 430.

We have (Fig. 86) a great rectangular court enclosed by walls D, which is fortified by two round angle towers, showing a square gate tower at the middle of one end. Behind this and separated from it lie two courts, which with the ditch separating them have the same width as this forecourt. On three sides and separated by a ditch a wall F extends around these two rear courts. At G the front wall extends in a triangle around the round tower, creating space for a wall, and then the wall also runs along the great court. On the opposite side at H is a small detached rectangular court, enclosed by towers. At both ends of the entire work stand separate triangular outworks O, through which the entrances lead into the castle.

A moat surrounds the whole, its water also enters all internal ditches, so that each court, every part of the enclosing wall, and each separate work [illegible] washed by water. All walls are furnished with external embrasures, that are l low and broad, so that on all sides at the same time can be maintained a well calculated fire of artillery. The square t towers exhibit projecting defensive platforms, on which also artillery could be placed behind the battlements. The defensive galleries project and are wide, but are only intended for small guns. The round main towers, of which besides the two mentioned at the main court, there exist four others in the enclosing wall, have several rows of defenders, just as those previously mentioned at Pierrefonds. All parts are conveniently connected by bridges, although separated from each other by moats. The principal entrance is at I, where a doubled drawbridge exists; before this on the outer side of the moat is further a protecting wall, which first receives the shots of the besiegers, and are kept from the wall K enclosing the outwork O.

As the source for his representation Viollet-le-Duc gives a German copper engraving of the 16 th century.

Chapter 10. The Castle Tower and Strong House.

119. Castle Towers.

We have alreadw stated, that a main difference between the fortification of a city and a castle or monastery does not e exist, that iu both cases it proceeds about the same, namely with the greatest possible resistance to extend a wall, or s several if necessary, around a number of buildings; such buildings were comprised in a city rather than in a castle, since the area to be enclosed was even greater. If then the different buildings standing within such a ring wall served similar purposes, they were also entirely similar in the city a and in the castle. We have noted a strong tower [147] in the e earlier time in each castle, in which the master of the castle himself, i.e., his vassals found shelter, and had his dwelling, who with his men had to defeud the castle, while these men built huts for themselves in the court of the castle. With the small comfort offered by such a castle, it may thenceforth be where it was only possible, that also the master of the castle preferred outside the tower,- to which he retreated only in case of need, like his men to build an open unfortified dwelling for himself in the castle court, which in the l largest castles of men of the highest rank was soon executed in stone, and as a palace as well as a ladies' building assumed a special architectural development.

Note 147. Men have thought, that for this tower, the donjon of the French and the keep of the English, should be introduced among us the German word "Bergfried" (hill peace), but t the ancients employed the name to designate other objects, b but never assigned it to such a tower, so that justification of the use is wanting. We have therefore entirely avoided it.

Yet one would err, if he wished to believe, that this development of house architecture in the castle was in any chief thing essentially different from that, which house architecture passed through in any other place, particularly in the c city, in the castle or in the monastery. We shall therefore first speak of the palace in one of the next hefts. But also in the city in these warlike times not everyone could believe, that he must equip himself only against external enemies of the city, only having to protect himself from such. On the c contrary even in the city were hostilities; even in the city

were factions, and many must first think of defending their houses in the city, just as the master of the castle would n not surrender, even if the wall of the castle had fallen, so long as his strong house, his tower still stood. Therefore we also find the like towers in the city in the earlier time, a and later the same strong houses as in the castle.

Indeed there also occur cases in which the castle tower itself is built on such a large plan, that in the views of the time it could always present a convenient residence; this is preferably in England, also partly the case in France. In Germany the great castles belonged to the princes, who held court there, their living and festal room, that was arranged without any defenses, was so far developed, that the need never occurred at all, to also have a residence in the tower besides these. The strength of a court castle availed only against the subjects, at most to protect it from surprise. That a great army, which had already taken the city adjoining the castle of the prince, should be yet longer delayed by the latter, appears only possible in the earlier time. Later, already in the 12 th century, the prince would not at all remain in a r regular siege in his castle. Therefore we find in many great castles, that this principal tower is entirely omitted, as in Nuremberg, unless the later so-called "castle of the burgrave" with the still existing substructure of the pentagonal a and the gate tower formed a structure like a donjon, and so in Brunswick, where it was probably replaced by the palace s structure of Henry the Lion. But in smaller castles, that already existed in Germany in such great numbers, the possessor was not in the fortunate condition, to be able to make great requirements in regard to convenience in his strong house, h his tower. He was satisfied with the very simple, but therefore the so much stronger form of it, and he did what he could for his dwelling occupied by him, also certainly not always of stone, and in case he could have a considerable body of men around him, for a hall in the dwelling or a hall structure. Also no principles of fortification, other than in England, in Germany prevented the development of the tower into a keep; this rather depended on the different social position of the vassal.

120. Tower of the Wartburg.

120. Tower of the Wartburg.

In the consideration of the different examples of plans of castles, we have sometimes found square and rectangular, sometimes round and octagonal plans of these main towers. If we had chosen fewer examples, then according to selection, we w would have also come to the case, to regard one of these forms as the earliest, another as the later. However although it is indeed difficult to fix for each castle the date at which falls the building of its tower, which is mostly the oldest monumental structure of the same, and not always also rebuilt at a later reconstruction of the other works, but yet indeed we believe it necessary to state, that all the forms mentioned occur at the same time, and that only the personal preference of the master was decisive for one or the other f form. Therefore we can select as an example of such a tower of the earlier time first the square southern tower of the Wartburg.(Fig. 87). (Art. 57, p. 62).

It is relatively small; its lower story is vaulted, also t the second story, while the two highest stories have no vaults. As in all similar designs, the entrance does not lead into the ground story, but is found high above the ground in t the second story, so that it was generally only attainable by means of a ladder, unless the person entering was drawn up by a rope lowered by those inside. The enemy could only take possession of the tower, if he succeeded in overpowering the high tower by storming ladders, but by which the entrance of s several enemies at the same time was impossible, while the i individuals entering could be easily overcome, if a couple of efficient men stood inside. One could only pass down into the ground story from inside the second story. Its only light was received through a slot high above in the vault; for ordinary windows at a corresponding height, the chief work of the enemy became correspondingly reduced, to overthrow the tower by breaking out a great hole and constantly enlarging it at the bottom, or by masses of combustible material thrown in and t then fired, to cause it to crack. To make this labor more difficult was the purpose of the massiveness of the walls and the absence of windows. Furthermore the tower could only be taken, when a wooden and if possible a somewhat higher tower was shoved against it, from the platform of which the upper

defensive platform of the tower was reached, thence overpowering the defenders. How difficult this was is evident, as being scarcely conceivable.

The tower in the Wartburg still ektends to the line A B, w which was originally the defensive platform. In Fig. 87 we h have drawn the buttresses and a projecting wooden defensive gallery. That the latter existed here, now fails naturally every starting point for us, and for the description of the defensive gallery, that nowhere exists now, and we can only infer it just as it is drawn on this tower, since even the most scrupulous critic cannot prove here, that it did not exist; for the tower might even have been a story higher. The slot windows found in the different stories are somewhat larger t than usual; they were also enlarged indeed later. Through them could enter a not too large enemy.

We believe that we see in this tower a remainder of the oldest structure of the Wartburg. It is well known, that in the works of restoration a second tower, designated by the restorer as the proper keep was proved and again restored. The position of the existing one given here, so far at the most extreme point, indeed no longer corresponds to the plan of the ancient mound, whose tower stood at the middle. Meanwhile we find, that men soon transferred the tower from the middle to near the enclosing wall, in order that the first attack the defenders of the wall could be aiaed from the tower. But then we have also found in certain castles two such principal towers , when they stand at about the ends of a long terrace, a and so it is not impossible, that the Wartburg also had two such towers.

121. Tower of the Fortress of Steinsberg.

One of the finest, because the most complete example of such a castle tower is formed by the octagonal tower of the fortress of Steinsberg near Sinsheim, faced with ashlars with bosses, of which we give in Figs. 88 to 93 four plans, an elevation and a section, that we have attempted to restore from t the beautiful drawings published by the Society of Antiquaries of Baden. The building is properly attributed to the 12 th century, and it thus gives us a very important example.

The ground story is square in the interior, while the tower is externally octagonal. It has a lintel opening high up in t

the vault, and an opening below in the floor, that leads to a shaft, now indeed filled up, yet which tradition designates as leading to subterranean passages, so that we may have before us one of those secret connecting passages, of which we hear so much and know so little. Perhaps it was also a well shaft; for when the tower must afford a longer stay for a besieged garrison, it must indeed have water; but just from such a well shaft was it again easily possible to extend passages at different heights. Such subterranean rooms, even the ground story of the castle tower, are mostly traditionally reputed as oubliettes (for starving prisoners). In any case the ground story originally served as a cellar storeroom, that was of p particular importance to the besieged defenders. Later when the original purpose of this tower had ceased, it may indeed have served as a dungeon. A. Schultz also sees in the ground stories "treasure chambers." This may be correct in princely castles; the ordinary German master of a castle needed no tower for his treasures.

The second story of the Steinsberg tower contained the entrance, and higher above it was a small opening for light. Two projecting corbels below and above the entrance show, that b before it was built a wooden structure, which allowed while covered, the dropping of great stones down on the enemy, who came beneath the doorway and wished to raise ladders, to pour boiling water or pitch, and that in times of peace contained a windlass, that hoisted to the tower. The room in the second story is circular, and is covered by a horizontal vault, that has an opening at the centre, through which one could ascend a ladder into the third story. At a later time was constructed a second entrance, when a house was erected in the enclosure of the castle, that rose high above the wall, and from w which in case of danger the master of the castle would go at once to the tower. The connection was made by a wooden bridge, that indeed remained permanently, but could also be quickly destroyed, if an enemy would attempt after reaching the court, to pass through the undefended residence into the tower. There now follows a story with a wooden ceiling and a small light opening, then a low story also with a wooden ceiling, but no opening for light, yet with a fireplace, whose flames sufficiently lighted the room, and which indeed was less intended

to warm the little room, than to cook the food for the besieged, to boil water and melt pitch, that were cast down on the besiegers. The room lying above it was also without windows and is covered by stone slabs, in the middle of which is again an opening, that both admitted some light and also permitted ascent to the upper slab, that corresponding to the 8 sides of the tower, had battlements with 8 verticals and 8 openings. It is said that these battlements belong to a later restoration; but in any case the corbels are old, which are set below the battlements, and thereby indicate that a projecting wooden construction was placed thereon. Such corbels may possibly have existed before the restoration, so that a projecting passage around it may have been placed on them.

122. Protecting Roofs.

The importance of such projecting galleries for the defense will be mentioned immediately; still we shall not connect their consideration with the present example. On the contrary the stone defensive platform affords an opportunity to call attention, that there a casting machine could be placed, that was adapted to substantially injure au approaching enemy, who desired to establish himself fast before the castle, by casting great stones or other things. Men knew how to make such slabs watertight. Yet they preferred always to not leave the slabs permanently uncovered. A roof was placed over them, that was not connected with the stone construction, and could easily be removed, if a regular siege of the castle was foreseen. Then also were set up first the casting machines. Such a regular siege could not be made by a surprise. Before it could commence, one always had time to prepare himself. What was ever to be feared was only a surprise by hostile neighbors, who desired to take the fortress by a sudden storm; the casting machines could not help against such. But indeed the continuing effect of weathering also produced in our climate on the best stone and the most careful construction, did not remain unnoticed. Therefore men usually preferred to add a protecting roof to the tower. We must regard this protecting roof even for the 12 th century as a merely temporary structure; for men knew not how soon it must be removed. Only later, when men saw that the defensive platform was used quite seldom uncovered, a more definite form was given to the temporary roof.

123. Tower of Castle Landseck.

Castle Landseck, that we have illustrated in Fig. 31 (p. 71), has its toweh set against the enclosing wall, indeed just at the place, that was naturally weakest by nature, wherein art has thus combined all means of defense on the north side. We give this part of the castle in Fig. 96 enlanged from Fig. 31, and also add a plan and a section (Figs. 94, 95),[148] which p permit us to recognize, that the tower is scarcely conceived as a proper living room. It exclusively serves the momentary purposes of defense of the most accessible side, and in a second way of the entrance gate.

Note 148. Attempt at restoration according to the drawings of Naeher and von Cohousen. (See Note 72, p. 80).

It has in all three stories, the middle one of which contains its entrance. Corbels below this and holes [149] over it s show, that a wooden bay could also be constructed here, just as at Steinsberg. Otherwise the interior of the tower was not connected with the other fortifications. [150] Stairs do not e exist; thus also here through openings between the beams rope ladders formed the way into the ground story, and common ladders the ascent into the upper story and thence to the defensive platform. The tower was set directly against the wall; it even entered into this a little, so that this strengthened the lower story of the tower, and its defensive gallery passed directly along the exterior of the tower. The wall on this side also had a low outer wall; thus aside from the external wall of the enclosure, two rows of defenders stood at the foot of the tower, the third being on its defensive platform. We can conceive the defense of these walls only by projecting wooden defensive galleries, and therefore have had no hesitation to represent such on our illustrations. The tower is preserved for its entire height, thus the plan of the battlements is to be recognized; how these wooden defenses were fastened is indeed not evident. It would be conceivable, that they were arranged as in Fig. 94, and that the holes were later filled. But without such it was entirely impossible, with the t thickness the battlements must have, to dominate from above the foot of the wall or the lower defensive galleries, while yet in a possible case the defense must be continued, even if the enemy had already possessed himself of the lower works.

Even if the approach to the lower works could not be hindered, if the enclosure were once in the possion of the enemy, which indeed was easily possible here. We have drawn in Fig. 94 the limiting lines from I and II, if crossbow men wished to hit ar close as possible to the foot of the wall (archers could naturally not be included, except at III). If the enemy had crossed these lines, which with the small garrison and the s slowness with which the straining and preparation of the crossbow occurred, was easily possible, then could he do what he pleased at the foot of the wall; no defender could harm him, unless projecting galleries existed from which he could be d directly hit from above. Without such projecting galleries t the tower was only in greater danger, if the walls were ascended, since it could be ascended more easily, than if it stood entirely free. We must also assume, that such a one existed here. Was here as everywhere, where every indication of such a necessary construction is lackiug, the projecting defensive gallery a story higher, above the roof battlements and in connection with the roof, with bays here and there? [151] Thus also in contrast to Figs. 31 and 94, we have drawn in Fig. 96 this defensive gallery about a story higher, and as lying entirely above the battlements.

Note 149. Are these perhaps light openings?

Note 150. An opening C is new.

Note 151. See Chapter 14.

124. Tower of Castle Giblet.

What the buildings of the crusaders primarily brought into consideration is the extensive use of crossbows for defense, which produced a different construction of the battlements. We have spoken in Arts. 29 and 30 (p. 29, 97) of the city and castle of Giblet, whose fortifications were built by crusaders. We have also stated, that these must be surrendered to the M Mohammedans in the year 1189; we have no ground for assuming, that they made these substantial alterations, since on the c contrary they destroyed the castle. In a possible case certain changes were made in the 13 th century. Therefore in spite of isolated occurrences of pointed arches, in which we may p possibly see partial alterations of the 13 th centurw, we can regard this tower as a work of the second half of the 12 th centurw. On the ground of the drawings published by Rey, we

give in Figs. 97 to 99 [153] the two plans and the longitudinal section of this tower. The same scale as the other plans and sections at once permits recognition, that it far surpasses the German in extent of plan, but is scarcely equal in height. Naturally in the East the tower was even a defensive work, t that could be held by a corresponding ga rison. This allowed an extent, which a German master of a castle could not have garrisoned with his men. There must be on the upper defensive platform alone about 40 men for merely manning the slots, and with the slowness in handling the crossbow, if a corresponding rain of arrows should occur, a corresponding exchange must e exist, so that at each slot must be at least two men. If we add thereto the men required for assistance, the subordinate officers, we compute that equal losses must be taken in consideration, thus we regard a garrison of 100 men for this tower as certainly not taken too high. We shall then not be surprised, that the lower story at the springing of the vaults exhibits a row of holes which indicate that there was also a floor; for if we think that also entirely placed as in barracks, about 100 men had permanent quarters in the tower, then we do not envy the use of night quarters, since just in the East sleeping on the defensive platform could be conceived, three separate stories were constructed, one of which with the floor mentioned not belonging to the original construction but inserted therein later. Men chose just the lower story, since this had the least importance for the defense, because surrounded by the outer wall; for there is found in this ground story a slot only on the east side, through which if the outer wall were taken, a single enemy at the east side could be hit, who stopped just at the middle of the crown of the wall.

Note 153. From Rey. p. 119, 120.

Unlike the German, the tower is not a point of last retreat; it is also no residence tower, like the French; it is a barrack. It has its cistern in the cellar, in which the water collects, that was contained in the rock and earth around or fell thereon. As a barrack must the tower be accessible on the ground level, and have direct connection with the terrace of t the court. If an enemy showed himself at the door, there were men enough to repulse him; therefore besides its heavy leaves it was not only furnished with a portcullis; a drawbridge would

hava hindered its own men when closed on the enemy, and must be left free. Therefore no ditch and no bridge before the gate. These were the more superfluous, since just in Syria if a castle in general could no longer be held, it did not allow itself to be stormed, but surrendered under the most favorable conditions possible. Therefore men did not at all consider, that a very hard fight could arise about the doorway; they did not go so far with protection, that this might obstruct their own movements. Thus it was also necessary, that the men could ascend from the court upward as quickly as possible; hence the entrance to the stairway in the thickness of the wall was placed directly in the jamb of the doorway. The exit in the second story is first in the second niche in the north wall, the entrance to the defensive platform is again in the western niche. While the south side has three recesses with slots for shooting, two sufficed on the north side, since an opposite tower lay outside, then because the ascending stairs would be interrupted, if between these two niches had been placed a third.

The most interesting part is the defensive platform, where under the ordinary battlement construction, that served as well for archers as for stone-throwers, was still arranged a row of niches with slots, which were intended for crossbow men. Since the tower should only serve for the general defense of the castle, thus a projecting defensive gallery was superfluous for protecting its foot, and so the defensive platform, on which several casting machines could stand, remained without a protecting roof, as that climate required no roof.

125. Keep of the Castle at Arques.

An example of a great residence tower is given by the Norman castle at Arques near Dieppe, that is visible in the general view of the castle in Figs. 16, 17 (p. 55, 56), and of which we reproduce the plans of the four stories in Figs. 100 to 103.[154]. The representations at the same scale at once allows the recognition of the ratio of magnitude to the tower of Steinsberg, as well as to the barrack tower of Giblet.

Note 154. From Viollet-le-Duc. Vol. 4. p. 33.

It first occurs, that also here not the same value is placed on inaccessibility, as in the German castle towers, where one did not have to do with permanent habitation. The keep stands

at the southern end of the castle directly by the tower B (Fig. 101). from which over the bridge A led the exit mentioned in Art. 53 (p. 55) to the ravine, that we have to regard as a s sallyport or escape gate, and that lay entirely in the domain of the tower, yet watched by a post in the little room O. At M was an exit cut in the rock into the castle ditch and to t the subterranean passage extending parallel to the same. At L is an entrance built later. The two rooms I on the ground level were originally not accessible from outside. At K is a w well. What makes the plan so complex is the fact, that in none of the three stories, even in the third story, could one pass from one of two main rooms lying beside each other into the other; then must therefore be made two stairways. At D is one of the entrances to the third story, to which the stairway E leads; to reach J" must one use a hole in the floor of J"", from whence the stairway F leads out from the ground story, and from J" one first descends again into the room J lying beneath it. In the third story at both sides of the stairway F' at P a sufficient number of defenders could stand, who could attack from above an enemy, that had penetrated from D, and above the uppermost part of the stairway at Z were still holes in the floor for dropping, through which boiling water could be poured on the enemy. But also a second stairway led from the outside above F through G to a winding stairway I, from this under R to a stairway found in the wall, that ends at S in the third story; another stairway N led from deep below through the tower B and thence through P into the room J' of the second story, in the angle of which at Q was placed a winding stairway, by which one likewise passed to the room J"' in the third story. Another stairway at T was in connection with that beneath, so that one could also pass downward through P' from J"' by N.

The uppermost story, which had a single hall X, is entirely destroyed. Viollet-le-Duc and previously Deville have restored it from drawings of 1703. This story was only accessible by the winding stairway at O from the room V of the third story; one passed into the anteroom Y, and from the other side of the stairway to the defensive gallery c. From Y the way led into the great hall X, that was furnished with a fireplace f and a baking oven h. Through the doorway b were accessible

the holes a for droppings A passage e leads to the face of the wall, so that one could also thence look down into the ditch and could see what occurred outside.

126. English Castle Towers.

In all English towers is found in the 12 th century the lower stories divided into two rooms, just as carried out here, while the upper story contains a great hall, to which many of the castles give the name of "hall". Likewise the separated arrangement of stairways is similar to those existing in the tower, like the stairway E in Fig. 101. We refer to Clark's Mediaeval Military Architecture in England (London. 1884), where a series of examples [155] of such towers are found, but which partly by great windows already show from afar, that the possessor felt himself safe enough, and depended more on his own strength and that of his men, than on particular measures for defense. The latter preferably consisted in passages in the interiors of the walls, that were connected with the rooms by doors, and furnished with many slots outside for shooting. Through the latter entered light in sufficient measure, even where great windows had still been avoided. The rooms are conveniently connected, that is not merely by roundabout ways, as in Arques.

Note 155. Dover, Norhom, Scarborough, Rochester, Porchester, White Tower in London, etc.

But it is still clear, that merely for the comfort of living very little advance had been made in such towers in spite of their considerable size; for if in Castle Steinsberg 10 to 12 men could hold it, as well as it could be held in general, and it must not be once lost, if by losses the number were yet reduced, then in Arques and in a tower as at Dover and Rochester, 100 men were necessary, if it were actually besieged all round, and must be defended. But there must not only be collected therein in the moment of danger; the master of the castle in time of peace must divide his dwelling with them.

127. Tower of Castle Trifels.

The few German towers for residence are therefore planned substantially smaller than the Norman, then that of Trifels, of which we reproduce here a section and 3 plans in Figs. 104 to 107, [156] with a reference to the view of the castle in Fig. 37 (p. 77).

Note 156. From Naeher, J. Die Burgen der rheinischen Pfalz. Pl. 2. Strasburg. 1887.

Indeed compelled by the location, this tower has in the ground story not merely an entrance, but also opposite this an exit, through another building into the court. The ground story consists of two vaulted rooms, that externally are furnished with little windows; from the same lead two stairways arranged in the inner wall up to the second story; one starts just from the jamb of the entrance doorway, as the case in the castle tower of Giblet, that we have just treated, so that a certain relationship with oriental buildings is not to be denied. One such also lies to no small extent in height; for if also on our general view (Fig. 37) the tower still appears stately by the substructure, which is properly merely a facing of the rock, yet it still one about the least height of the German castle towers.

Above the ground story is found an upper story, that consists of a richly constructed chapel in partly developed architectural forms, whose altar space is built out as a little choir, and an anteroom with a fireplace. [illegible] was connected with the adjoining [illegible] by a doorway. Likewise [illegible] found also in the [illegible] story [illegible] vaulted [illegible] a connection with the attic of the palace. [illegible] tower [illegible] already attached to the residence [illegible]. [illegible] battlements [illegible] are wanting today; [illegible] extending above the projecting cornice can [illegible]. As a thorough consideration gives, [illegible] can scarcely bring this tower into connection with proper castle towers; [illegible] more than the upper defensive platform, [illegible] otherwise nothing but a dwelling, [illegible] defensive [illegible] its battlements is put in condition, [illegible] for a short time against [illegible] enemy. [illegible] castle it was [illegible] only for [illegible] side, and also [illegible]. [illegible] it was either of the external towers [illegible] useful, [illegible] particularly the well tower [illegible], in [illegible] position.

128. Tower of Castle of [illegible].

Entirely allied to the tower of [illegible], [illegible] for the main part still well preserved, [illegible]

castle at Friesach, that in Fig. 44 occupies the middle of the view. (p. 87). We give here in Figs. 108, 109, two sections of it.

It has three stories below, that served as storerooms, above them in a high story being a pretty chapel, the uppermost being a living room with fireplace. The living hall has great windows; also the chapel has windows of such size, that if one ascended, he could easily pass through them. The walls no longer have that thickness as in the actual castle towers, in several stories was arranged a connection with the residence; a stairway was made conveniently accessible, so the entire tower also here as at Trifels is merely a part of the unfortified residence itself, certainly as at Trifels furnished with a defensive gallery enclosed by battlements, on which rose a high roof. Since the living hall is not vaulted, so that men thought in the erection of the tower scarcely more, than that the roof might be removed. We leave it to the honored readers to conceive for themselves a projecting defensive gallery, either outside the battlements or above them at the edge of the roof in Fig. 109.

It is evident that the tower was no longer strong enough to serve as a last refuge; as little as that in the Trifels would it have been able to hold out in a siege for but a brief time, as then assumed for the work at the time of its erection at the close of the 12 th or perhaps only at the beginning of the 13 century. It could have been caused to fall quickly; but against a momentary surprise, even against an energetic storm it was indeed to be defended, and therefore had great value for the defense of the entrance to the palace and the inner court of the castle. If before this entrance were found a ditch with a drawbridge, and a stairway [illegible] along the northern inner wall of the lower [illegible] rather steeply to the tower, this could be destroyed from the defensive platform; even the slots that lighted the lower story of the tower, if garrisoned by archers or marksmen, could cause difficulties for the assailants. If the men of the tower only approximately did their duty, every attack on the gate lying beside it could be repelled. But also for the general defense of the castle the form had its value, like that of the Trifels, and shooting from its defensive platform and defensive galleries,

if such were constructed with the high position, since they could cast downward crossbow bolts and arrows, even spears and stones, with tolerable safety along both longer sides of the castle on the approaching enemy, even when his upward shots must be entirely without effect, and even if the archers stood unprotected at the larger windows of the tower. But that men had recognized this fact, and made use of it with intelligence, results that on the south side of the tower on a level with the chapel floor was attached a defensive gallery, from which an enemy standing in the valley below and before the city gate could be most effectively struck. Thus this tower is in fact a very strong house.

It may yet be noted, that in the lowest story is found a shaft cut in the rock, that has not yet been examined, so it may possibly be a well. Meanwhile this appears to us little probable, since already the tower is not designed as a last resort, in which a garrison could hold out. We conjecture, that it is a way of escape, through which the inmates could fly, if they were not in condition to resist an invasion.

129. Towers in Cities.

Thus we see, that on the one hand by the [illegible], on the other by the weaker form of the castle tower the [illegible] was increased in the castle, but the resistance was reduced against a regular siege, that also the strong ones [illegible] a shelter only against a sudden surprise or a quickly [illegible] storm. We find also a similar course of development in a series of city buildings. Both in Italy as in Germany were erected formal castles in the streets of the city. These towers, that we find as castle towers are mostly somewhat higher, indeed also erected on smaller plans on account of the limited conditions of the ground, we find in the 11 th and 12 th centuries also in cities, just as defensive and even [illegible] against a siege, and even if most of these towers have since disappeared or were rebuilt, then Italian places like Bologna, still offer sufficient examples, and even in [illegible] at the entrance of Metzgl alley from Thorgasse St. (formerly [illegible] alley) such a tower is still preserved, that not one of the earlier enclosures of the city might have served as a wall tower, if already once the city wall passed just there, yet a tower of a city wall never had a similar arrangement in [illegible].

These towers partly stood by themselves, at most being enclosed by a wall like the mound, and also the before illustrated mounds of Rüdesheim may have been nothing else than such castles built in the city, for Rüdesheim indeed had several of these. They partly stand in connection with other buildings, that were formerly more or less strong. Upper Italy also still presents many such structures. Particularly in each older city the city wall was such a castle with a tower. The bishop's palace, house of the canons, the guild houses, the houses of wealthy families and many others were such castles.

In the 11 th century also these towers had their entrances at a height from the court, where they existed; they had only small slots for lighting and their defensive platform above. The courts were enclosed by walls with battlements and defensive galleries, and where buildings were visible above them, these were without windows next the street, furnished above with battlements and defensive galleries. But still less than in the separate castle was the need of defending them against a formal siege of long duration, and even more in the foreground was that of having pleasant and comfortable rooms.

The number of newly erected castle towers in the cities is right small from the second half of the 12 th century. We see in Italy, that with the close of the 12 th century a great number of castle-like city halls and other buildings receive those graceful ones with arched windows resting on slender columns, that are characteristic for the last years of the 12 and beginning of the 13 th centuries. But otherwise the houses retain all the defensive equipment, which can protect them against a surprise. Likewise in Germany were conditions entirely similar. Regensburg still has standing in its streets a considerable number of towers, which undeniably could have been only private fortifications, but [illegible] the windowless as such were in general. But with the 13 th century were they superfluous as fortresses, the [illegible] in one way or another, they received on their front one [illegible] window above another; they only remained unbroken below; for all [illegible] desire, that every one on the street could [illegible] the house. Likewise their defensive platforms and battlements, also the defensive galleries may have long remained in defensive condition, indeed till the close of the [illegible] era.

130. Niederburg at Rüdesheim.

A transformation in such a sense may also have been experienced by the castle of the 12 th century by the Niederburg at Rüdesheim,[157] one of the earlier monumentally built mounds, that we have described in Art. 43 (p. 43).

Note 157. See Cohouses, A. von. Die Burgen von Rüdesheim. Cent. d. Bauw. 1888. -- Then in Ann. d. Ver. f. nass. Alt. u. Gesch. Vol. 20. p. 11.

We certainly do not have the intention to attack our highly deserving friend von Cohausen, if we make known here our opinion somewhat differing from his own; we rather lament, that we cannot agree with him. But he assumes, that the rebuilding occurred at the end of the 11 th or beginning of the 12 th c centuries. That men then knew the comfort of livin, such as the Niederburg shows us, that then a castle of whatever kind was externally furnished with several rows of house windows, is absolutely not proved by any other example. Yet also the windows themselves exhibit the latest Romanesque forms. We reproduce in Fig. 110, anticipating a later chapter, from von Cohousen's drawings one of the double windows, that already doubtless belongs to the close of the Romanesque period, thus about the year 1200, not of a time 100 years earlier, whose hard strength is still in the fullest contrast to the play of mouldings, in which round and hollow pass into each other without forming an edge. Without doubt the rebuilding occurred, when in the beginning of the 13 th century the Niederburg had lost its importance after the building of Ehrenfels and the rebuilding of the Mouse Tower, and it had passed into the free possession of the lord of Rüdesheim.

As there stated, it was originally surrounded by the water of the Rhine, and consisted of a not very high wall, approximately rectangular with a tower in one angle and [illegible] entrance [illegible]. In our plan [illegible] in Fig. 112 this entrance is marked A, and the tower with [illegible]. Since also [illegible] tower C also appears to be very old, [illegible] F have likewise originally existed, [illegible] walls have [illegible] the same height as the entire outer wall, [illegible] scarcely [illegible] the existing one. A. von Cohausen assumes, that [illegible] opposite corner near F a similar tower stood like C, [illegible] left vacant by the removal of [illegible] existing [illegible], [illegible]

which naturally cannot be conceded, but also is not necessarily to be held as absolute, since W also may have alone existed, and the position at this angle may have a sufficient motive in the protection, which the tower directly offered to the entrance. According to von Cohausen's opinion, the principal tower G must originally have not existed at all, so that W was on the whole the castle tower. Yet if also the [illegible] existing tower G must have been erected later than the adjoining buildings, then may we still not assume, that the mound did not have a principal tower inside, but it was limited to W. In any case G must have been added soon; for later, after the rebuilding to be mentioned now, would one have scarcely built it, if already the addition at the [illegible] angle to the adjacent buildings shown, [illegible] a later rebuilding of the tower occurred. In the court of this mound may then have existed from earlier times some small structures of different kinds. But about at the close of the 12 th century the outer wall was raised and a series of buildings arranged around, that are vaulted throughout, and besides the cellar and ground stories still have two upper stories, so that only a little court remains in the middle, since the [illegible] tower [illegible], projecting from an angle, [illegible]. [illegible] now believe that there could have stood the [illegible] at H. [illegible] a great direction and [illegible]. If we now also [illegible] self-evident, that the [illegible], that the second story now shows externally, all date from [illegible], [illegible] well defended entrances A B C, [illegible] the interior, then the second story [illegible], [illegible] entirely sufficient window openings [illegible], [illegible] enough for an enemy to enter by, if [illegible]. Just such windows [illegible] the third story. [illegible] tle; [illegible] comfortable [illegible], [illegible] 12 [illegible] century was [illegible] of the [illegible], [illegible] a lady (countess [illegible]) [illegible] the [illegible] table [illegible] it, although the exterior [illegible], [illegible] any substantial alteration of [illegible] 12 [illegible] century.

If the castle was thus transformed into a [illegible], it was still a very strong house, that could [illegible] of [illegible] ed against any surprise, and for this it [illegible] in every detail. First [illegible] above [illegible],

extends over all wings and is only lacking over the entrance building. We have drawn in our section (Fig. 115) a roof on this defensive platform, since we believe, that such roofs were alway arranged for protection. Meanwhile one is accustomed to see just this Niederburg without a roof, and whoever prefers castles without roofs may quietly conceal it in our drawing; for the platform does not need such; it already had no roof in Merian's time, and today is entirely watertight without one.

The defense of the entrance did not present particular difficulties; so far as a strong house could be defended, thus against a momentary surprise, sufficient security was afforded. Already the landing could be made difficult by dropped stones, spears and arrows from the defensive gallery, as well as by the men found in the gate hall, and from the tower in the corner, and since indeed the boats could only come singly and land their men,[159] then the men in the narrow [illegible] never had to do with [illegible]. The little room B stood always under the protection of [illegible] defenders high above and placed on four sides. That it could not be particularly difficult to close the gate C at the right time, which opened inward,[160] or if the enemy could powerfully hold it open, to defend it so long as only a few men could support each other at the gate, and could relieve each other if necessary, since they had only one enemy before them, but the assailants were also strongly attacked from above. But also nevertheless, if the assailants had taken the gate, they found themselves in the court, they could be hit by the defenders from all sides, who stood in the defensive platform or behind the battlements. The court is small; if about 30 men had penetrated there, they filled it completely, [illegible] in every [illegible] vertically downward [illegible], [illegible] few could reach those on the defensive platform, [illegible] of the stones thrown down, every [illegible]. Thus the enemy must try to press inward as quickly as possible.

Note 159. Nothing is to be seen of any bridge. If indeed a such existed, it was narrow and in any case the part directly before the door was arranged for removal.

Note 160. A portcullis seems to have not existed, unless it

was found at the inner side of the little court, and was operated from the upper defensive gallery.

This intention was opposed by the arrangement of the stairs. To the second story (Fig. 114) lead three of those at D, E and F; each leads up to a little lobby, from which a storming enemy would find it hard to make his way upward. But if he did arise, on the right and left were doors, into which the defenders could escape and close behind them; in the wall behind them were beams, that could be drawn out, so that these doors were barricaded fast. But then the assailants must already possess great local knowledge in order to know whether to attack the door on the right or the left; for example, if at the stairs D he forced the door at his left hand, he found himself in the room N, from which he could go no farther, in which he might possibly be shut and captured by the defenders, while two ascents to the third story are found in the L-shaped hall at the right, which has two fireplaces O and P. Only the stairs F lead directly farther into the third story, while by the stairs E one could go no farther in any circumstances, than into the two adjacent rooms of the second story.

The second and third stories are divided by the tower W and the kitchen [illegible] into two sections not connected with each other, one of which besides its [illegible] galleries [illegible] three [illegible] and pleasant rooms, [illegible] L-shaped hall. Similarly as in the second story [illegible] to another place extend to the third story, [illegible] the stairways that lead from the third to the defensive platform. If the enemy could reach this by the complex ways, already a great neglect by the garrison was necessary, even if he had not merely attacked [illegible], but [illegible] at the same time penetrated on ladders from the court through one of the windows in the second or third stories. [illegible] windows were [illegible] barricaded by shutters and beams.

But if the enemy had reached the defensive platform, and [illegible] could obtain possession of it in fact, the defenders retreated into the tower, which was only accessible from the defensive platform. Fig. 112 gives the plan at this height. Today the tower is torn away there, and we leave it to the imagination of each one, whether he agrees with what is drawn, or imagines it as it was originally, whether [illegible]

several stories, that could be occupied, with a defensive platform again at the top, from which men could also pelt the assailants, who had already taken the principal defensive platform. On our part we would never carry a defense farther, than an effective result is conceivable, and leave it to others to be surprised by that last man of an army, who still defends himself in the last building against the entire hostile army with heroic courage. We would not build the tower for this purpose. But it may also have another purpose; our Fig. 112 shows, that outside the entrance to the square room, that leads across from the defensive platform, yet another passage exists, that leads to a winding stairway passing downward to a smaller square room in the thickness of the wall, that has a door furnished with a bar, which opens into the shaft, that in the interior of the tower corresponds to the cellar, ground and two upper stories of the house. We conjecture, that this room served for this, that by means of a rope ladder one could descend in the tower, and that there a shaft led to a subterranean passage, which indeed ended in the tower of the Oberburg, if it did not land anywhere in the open, so that these two castles standing near each other were connected together. Yet this is indeed only a hypothesis; according to our inquiries neither an investigation has been made, by which our assumption is confirmed, nor even by tradition does the suggestion exist; indeed an expert friend is of opinion, that it would be too great a demand to require the belief, that not merely did the Niederburg stand in water, and the cellar was then watertight, but also that below the bottom of the bed of the river a waterproof passage led to the land. This demand does not seem to us so great, if we examine the mighty plans of the 11 th century as well as those of the 12 th, and we also do not doubt at all, that either by this passage in the rock of the Rhine basin, or by artificial means, a watertight passage could be constructed. We see in our assumption such an actually necessary extension of the arrangements of this strong house, that we hold it wrong to not state the hypothesis.

Whoever desires to study the present condition of the mutilated remains, is referred to the drawings of von Cohausen, on which are based our attempt at restoration; there are only

added minor things like battlements, otherwise giving the existing condition.

131. Castle Ortenberg.

Meantime then still in the 13 th century were always castles, that depended on the strength of the principal tower, which was still called on to resist not merely a storm, but also a longer regular siege. Although in this respect the earlier t towers had proved quite good, yet men would give them still greater resistance on the one hand, on the other so arrange them, that they could participate even more actively. In Fig. 72 (p. 129) is given the plan of castle Ortenberg in Alsace, and in Fig. 73 (p. 130) is a view of the castle. There is visible on the north side of the castle the tower rising high above the other buildings, and which has a polygonal plan and is surrounded by a similarly arranged enclosing wall. We now reproduce in Fig. 116,[161] the plan of this work (at a scale of 1 : 500).

Note 161. From Woeber, J. Die Burgen in Elsass-Lothringen. Heft 1. Pl. 6. Strasburg. 1886.

We first have to refer to the ground form of the tower itself, that so boldly turns its angles to just those sides from which an attack must be expected. It is clear, that it could oppose decidedly greater resistance by the angle to shots coming from thence, and to the breaking of a hole, that might be enlarged into a breach. But men have also surrounded the tower to a considerable height by an outer wall, that would directly receive on itself and weaken the assaults coming from the outside. This outer wall has slot openings in different stories, behind which crossbow men could stand in niches. These passages or galleries around the tower were only accessible from it, and surrounded the tower only on the four south sides. Behind the tower the residence lay protected. Between it and the tower was a then a ditch f cut in the rock, to which one could pass from the narrow court G. Thence the way l led around the foot of the tower, yet without finding such a above. The tower was exclusively accessible by the elevated bridge from the upper story of the residence. In the tower i itself men ascended and descended in the usual manner from a story to story, and in each upper story men entered the galleries in the outer wall. This wall bore at top two rows of

strong stone corbels for the erection of an overhanging defensive passage, which in a possible case was doubled, as indicated in Fig. 73. High above a doorway at the west side leads to the open air, beneath which are corbels. Here could also be constructed a bay. Evidently there was found a weak spot below this; perhaps it was also possible to be lowered down here and to climb down over the rock, perhaps to carry a message from thence, while the besiegers thought of foricing the entrance at the east side. Aside from the small garrison, that could maintain itself in the tower of Steinsberg, by the arrangement of the outer wall with its single or double defensive passage and the slots for archers found in the lower stories, a far larger garrison was necessary to hold the tower; but for this it could also hold out long, if the other parts of the castle had already fallen.

But we also cannot leave these other works without also c glancing at the residence. Opposed to the greater castles, t that ever became more habitable, Ortensberg still always retained an exclusively military importance. The residence must shelter the garrison of the tower, and since it stands within the inner wall, its outer wall also forms the castle, and thus also this residence was externally furnished with defensive works; it was likewise a strong house with projecting bay and defensive gallery.

132. Tower of Castle La Roche-Guyon.

To the close of the 12 th century Viollet-le-Duc [162] attributes the erection of the tower of castle La Roche-Guyon, that rises on the flat upper slope of a rock, which falls almost vertically to the Seine, so that the tower is entirely separated from the castle lying at the foot of the rock, and forms a small castle by itself.

Note 162. Vol. 3, p. 80 et seq; Vol. 5, p. 58 et seq. -- We might attribute this tower first to the 13 th century, since nowhere in the 12 th century do we find an allied plan. The extreme simplicity of the forms, that in our opinion have their ground in the exclusively military purpose of the building, has allowed the author of the Dictionnaire to date the building somewhat too early. Positive historical statements concerning the date of erection are wanting. What Suger (abbot of S. Denis) says of the castle may indeed denote our building, but

still applies just as well to many others, and gives no positive starting points.

A very artfully arranged way leads over bridges and through narrow stairway passages cut in the rock from the castle, and at A (Fig. 117) comes from the rock into the light in the little court of the tower. The entire location and the course of this way makes it entirely inconceivable, that by this an enemy could approach the tower. The way is only one for flight and connection, that led the garrison to the lower castle. A Approach was only possible from the other side, and toward t this also a strengthening edge is given to the tower. It is no residence tower, more than the just described German, but is exclusively intended for defense and for permant holding in a long siege. Yet the entrance is not at a great height, b but is placed rather low above a flight of steps B leading to it, yet high enough to pa s on a bridge D from thence to the crown F of the wall, which on that side is pretty low. Then there is also but one quite low story under the floor of the tower, which one enters at C; above are two stories for the shelter of the garrison, accessible by the winding stairway at C, and a third round room standing at the height of the defensive platform, only enclosed by quite thin walls, in order to extend around it in the width afforded by the thickness of the lower tower, the platform as a passage surrounded by battlements. The court has at G an entrance into the outer enclosure, at P being a well. At the guard side of the tower this court is so narrow, that at the edge of the thicker wall it is so much the more, that at the edge it is not as wide as the rise of the terrace causes, but it rises so high, that it remains only the height of a story below the defensive platform of the tower, so that it must be regarded as a sheltering wall for the tower. Somewhat lower rises a second outer wall with a round strengthening tower T at the angle, so that on the exterior three rows of defenders over each other could r receive the approaching enemy. Around the enclosure further extends a ditch; outside this were arranged also rows of palisades.

However strong and independent was this tower with its outer walls and enclosures, still it formed only a part of the fortifications. The entire terrace was still surrounded far

outside by ditches and other works, that may be examined in Viollet-le-Duc (Art. Chateau) [163] by whoever is interested therein.

Note 163. Vol. 3. p. 80 et seq.

We only have to mention it here in general, because for it an exit from the tower or an entrance thereto was necessary, as one prefers to express it, so that the defenders could retreat into the tower if necessity arose, and thereby in general the men within it could communicate with those in the outer works. This entrance into the castle leads, if we have c correctly understood Viollet-le-Duc's drawings and descriptions, directly into the inner court through the doors H and G across a ditch F, that existed within the enclosure. In this way was a retreat possible, without disturbing the defenders within the enclosure and its wally by this retreat. Located in the projecting angle, the gate H could easily be defended against every enemy, that would enter there, since the defenders, who might always be found there, could both act from t the front and side.

133. Other Castle Towers.

The same form of plan with a little greater extent has the tower of Castle Gaillard. [164]

Note 164. Built 1197 - 1198. -- However proud was Richard the Lionheart of this "daughter of one year", then we must indeed not take "one year" too strictly. A secure castle may have been erected in a year; but in spite of the fact that p perhaps this or that individual part may be later at least, we must not deceive, and if we examine the keep in Viollet-le-Duc (Vol. 5, p. 69), we shall not doubt, that it first belongs to the 13 th century, and indeed was first built or strengthened by Philip August.

The towers of La Roche-Guyon and Gaillard show, that the p proper residence tower was also dropped in France about the change from the 12 th to the 13 th centuries, then becoming simply a military work, indeed like the tower of the Old Louvre and that of the castle at Rouen [165] only to be regarded as such, or that they were entirely omitted, as soon as the castle had within its circuit a series of strong houses; for as we stated at castle Ortenberg, that the house by the defensive works on its exterior became a strong house, then we

have to say of some of the buildings, which form the enclosure of Castle Coucy and of the later French castles.

Note 165. Viollet-le-Duc. Vol. 5. p. 71 et seq.

Certainly we would have opportunity still to consider thoroughly all the keeps and towers, arranged and developed in t the most idverse ways, which were yet built here and there in the course of the 13 th century in all countries, partly like that at Coucy, that in spite of merely military importance w was at least erected in extent in adherence to the old residence tower, and partly adhering to the small German towers. But so many of such towers, so many individualities, and since most of those to be noted here are also found in the wall and gate towers of castles and cities, to which a special Chapter is devoted, we shall limit ourselves here.

134. Tower of Castle Landskron.

But we must still mention one, which is the tower of the Alsatian Castle Landskron, that we mentioned in Art. 105 (p. 1 129). While we reproduce here two plans in Figs. 118, 119,[166] we shall especially refer to the rounding of the angles, as well as to the addition of the stairway tower. After the structure, as it is assumed, was erected in 1215 after the conquest of the fortress by the emperor Frederic II, the access is also arranged in a somewhat different manner, than in the earlier German towers.

Note 166. From Kouher, J. Die Burgen in Elsass-Lothringen. Heft 2. Pl. 5. Strassburg. 1886.

As at the French castles just mentioned, an external flight of stone steps leads up to the entrance. The wall there has a special thickness of over 13 ft., so that the entrance leads to a passage about 3.3 ft. wide lying in the thickness of the wall, that is lighted by two slots, and from which one at the tower entrance does not at first see the door, that leads into the inner room of the tower. The tower room is lighted by two slits and has a door to the winding stairway. The latter is well lighted and leads up to the defensive platform; also here the entrance is so arranged, that one did not see the entrance door leading into the interior, when ascending the flight of steps. The tower has a very small ratio of height. It counts but two stories below the defensive platform, and the platform must formerly have formed a fully developed third.

The outer walls are thicker than usual; the walls of the battlements, the slots of the battlements, of which each side n has only one, must have been shaped like windows; on the south side are found two corbels below the slots, so that a projecting bay could be constructed there. But beside these battlement slots like windows is also made at each side a slot for shooting, its opening widening externally. Whether in this f form they can date from the 13 th century or first occur in the 15 th, we leave undecided. Other examples of such slots are unknown to us, while all slots of the 13 th century known to us are quite narrow outside, so that even only an arrow can pass through but are wider inside, so that the besieger can scarcely see them externally, but the niche inside gave opportunity to manage the crossbow and to aim accordingly.

135. Tower of Castle Neuscharffeneck.

The chief importance of the castle tower, as we have seen in a series of examples, at the close of the 12 th century no longer consisted in being a last work into which men could retreat, and in which they could still hold out in a siege, but in that during the entire siege it could disturb all the works of the besiegers, and before all in the moment of a storm could injure them, wherefore it was also placed near the weakest place, against which the besieger would naturally direct his main force. Where already toward the close of the 12 th century the tower as such was omitted, there we see a work of different form take over this problem. We can substantially regard the entire rock mass of the Flechenstein (Fig. 35, p. 75) as an elongated and transversely placed castle tower; still m more is this the case for the rock faced with ashlars, which is somewhat thicker than that of the Flechenstein, even if n not quite as long, that forms the main front of Castle Neuscharffeneck in the Palatinate, and that we reproduce here in F Fig. 120 from Naeher (at a scale of 1 : 500).[167]

Note 167. Die Burgen der rheinischen Pfalz. Pl. 12. Strasb-g.

We have assumed in Fig. 30, that this rock in a regular form and externally faced with ashlars had a defensive platform at top, surrounded by battlements and crowned by a roof, so that it fulfilled the principal functions otherwise belonging to the principal tower. The entrance led directly over a bridge into the rock, which was separated by a great artificial rav-

ravine from the edge of the hill rising opposite, on which t the enemy must seek to establish himself. This could be made considerably more difficult, if the roof were removed from t the platform, and casting machines stood there; for among all towers none afforded such a long platform as our rock, where the machines could stand in a row, even if the rock were not characterized by particular height. But from the battlements througr thin slots could be sent a corresponding hail of arrows against an approaching enemy. In particular could also l larger wall crossbows and other arrow casting machines be employed, even if the roof remained standing. Otherwise the rock afforded little internal space, so that it did not contain s slots for shooting.

If we have correctly understood Naeher's sketches, then the wal yeads through the gate from the bridge A (Fig. 120), first to a grea chamber B in the rock, that beside the gate also c contains a similar great opening, later walled uf, whose purpose is not clear to us from Naeher's sketches. Behind this chamber extended a passage through the length of the rock, w which at the north led to the entrance to the castle court, b but was peculiarly arranged. For the passage ends by turning at a right angle, just at the place occupied by the second w wall of rock at right angles to the first one, and stands in the interior of the court, having an opening C D like a passage, that connects both parts of the court. On this passage now ends the central passage, which is so narrow as to permit friends or enemies to pass in single file, even if they held possession of the chamber in the rock, the gate with the bridge. Now stands behing the rectangular turn of the passage also a little guard room E. If some men were therein, and there were in the inner court 3 or 4 men at each side of the passage C D, then the most superior enemy could not enter. Still in this northern part of the rock soce niches are to be mentioned; there is to be noted a later slot intended for a small weapon in the guard room E, and it is to be mentioned, that on the south side of the entrance chamber a passage leads to the crown of the outer wall and by a winding stairway to the upper platform. Two little passages I and G with slots indeed primarily light the stairs, while at the same time they can serve for shooting.

136. Enclosing Wall of Castle Ehrenfels.

What in Neuscharffeneck is the purpose of this natural wall of rock, is the intention of the massive wall at Castle Ehrenfels, which encloses the castle on the side toward the ridge of the hill. We have given in Fig. 77 (p. 133) the view of t the castle from the ridge of the hill, showing there from the rear the massive wall flanked by two towers. As we have stated in Art. 107 (p. 134), the castle es built on the slope of a hill, and indeed according to von Cohausen the erection occurred between 1208 and 1220.

The slope of the hill toward the south is too steep, that anywhere in the vicinity of the castle can be established great siege machines, but not steep enough so that men could not climb the slopes of the hill everywhere, since from below men in great number could be sent against the castle. Against them it had to defend itself. While then terraces with retaining walls and battlements made climbing from below more difficult, the great work on the north side was directed against the enemy, who came down from the rock above, and that was separated by a cut in the rock from the slope of the hill; fulfilling the problem otherwise falling to the principal tower. We give on the adjacent Plate the plan and section of the work together with the nearly rectangular enclosing wall lying before it.

It is a wall 16.4 ft. thick flanked by two towers A and B, whose defensive gallery was so wide (11.5 ft.), that it may w well be termed a defensive platform, since at least machines for casting arrows could stand there, with which one could reach pretty well up the slope of the hill. The two towers, that later in the 14 th and 15 th centuries received original upper terminations, first supported only the simple projecting defensive galleries at the foot of the roof, from which the crossbow men could send their bolts on all sides. In the wall itself beneath the defensive platform was also found a vaulted passage, that made it possible by some slots to strike downward the cut in the rock. Furthermore there appear also holes for beams in the back of this wall, which prove that a w wooden defensive gallery was constructed there. We have then drawn this as standing and in the simplest way in Fig. 77, (p. 133), while it is certainly possible, that on the battlements of the defensive platform lay a roof with defensive gal-

gallery, which was connected with this lower one; for it is nowise improbable, that if there were sufficient men to oppose 3 or 4 rows of crossbow men to the enemy descending from the hill, to generally not allow them to come down into the ditch.. We must still state, that with such a simple form of defensive gallery, as we have shown it, it is impossible to reach it o otherwise than through a battlement slot, through a door in the roof (Fig. 77), so that thus on a certain probability it is based, that a complicated arrangement existed, from which one was protected from the platform or the towers, and could descend into this defensive gallery. The remarks for which o our illustrations afford opportunity are given in Art. 107 (p. 134) in the description of the castle in its general design, and thus need not be repeated here.

137. House of the Brigand at Connet.

When the castle tower now also completely lost its importance with progress in the 13 th century, and also the tower on buildings in the city no longer had any purpose, so far as it might not be utilized in the moment of a storm, yet it ever remained still the most suitable form for isolated houses standing in the country, that lay on a road along which not merely armies, but also all sorts of groups of doubtful fellows passed. Just as the crusaders established their towers between the principal castles as watch posts on the road, of which we have spoken in Art. 88 (p. 106), so we have found such isolated towers in Germany (Art. 103, p. 127), as in the Pyrenees such posts were built as military stations on the roads, [168] so were to be seen in many places those assigned to a solitary life, formal towers also yet erected as dwellings in the 13 th century and in part later. On or not far from the great traffic routes in Germany, we may have many similar examples, for surely it was here not different from other lands. But at the moment is known to us no such characteristic one, as which Viollet-le-Duc gives, which lies in the vicinity of the village of Cannet near cannes, about 2.5 miles distant from the sea, (Fig. 121),[169] bears the name of House of the Brigand, and m must correspond to several others lying on the same road. If Viollet-le-Duc is also inclined to assume this building to be the haunt of robbers, we do not doubt for a moment, that on the contrary it was the home of very peaceful folk, who found

under the necessity of having to protect themselves against robbers. Thus it served them, that the entrance was so high as to make a ladder necessary, which not everyone carried with him. For this served the bays found above, one of which was over the entrance doorway, that allowed those knocking, who were not willingly admitted, to be received with arrows, and to hold the house itself so long at night against "poor fellows", until the alarm had aroused the neighbors and called t them to help.

Note 168. Viollet-le-Duc. Vol. 9. p. 163.

Note 169. Viollet-le-Duc. Vol. 6, p. 298.

138. Fortified Houses.

But therewith we believe that we have exhausted everything necessary to learn concerning castle towers and such strong houses, that appear in tower form. But we have not therefore terminated our Chapter; for as we have said already, that in the same measure as the tower of the castle recedes, the fortification of the house advances, which must afford safety a against a storm. It is also similar in the cities, and if in the 12 th century the palce is defenceless, then already in the 13 th century defensive arrangements are connected with the hall structure of the castle and the palace of the city, both these applications referring to the same source, as we have already shown. We find such then until the close of the 15 th century, when fire-arms had obtained such importance, that men could never trust themselves to battlements and defensive galleries in general.

But the fortification is still peculiar. It was stated in Art. 129 (p. 167), that the houses of the wealthy and permanent residents of cities in the 11 th century were castles, but at the close of the 12 th had almost completely lost their fortress-like character. Still more was this the case in the course of the 13 th century, and the archbishop's palace at Paris (Fig. 122), as Viollet-le-Duc [170] has restored it, was an entirely open house, that however was furnished with battlements at the edge of the roof, from which malevolent men could be injured when approaching. A small tower is rather a reminiscence than a fortification, even if entrance be also under its protection.

Note 170. Viollet-le-Duc. Vol. 7. p. 170 -- But it is assu-

assumed, that it could not have actually so appeared from 1160, when also Maurice de Sully consecrated the chapel.

In such manner from now onward are arranged the principal b buildings of cities. The residence castle erected in Vienna about 1220 by Leopold the Glorious, consisted of four similar wings around a square court; the four angles were occupied by massive towers. According to all that is established concerning its condition then, the wings and towers contained living rooms. We know nothing at all of the defensive works. However the building of Leopold may have been rather just a "castle", 171 than many others; yet after rebuildings and extensions, after for a long time no vestige of fortification remained, it today still retains the name of "Castle"; yet was this castle so often besieged and taken until it was rebuilt under F Ferdinand! Thus also for the 13 th century it still had defensive works, and therefore was not dissimilar to the castles of the Teutonic order in plan and defensive measures.

Note 171. The 6 th volume of the "Mitt. u. Ber. d. Wien. Alterthums Vereines" is devoted to the Vienna castle, and attempts at restoration are added, but which aside from various m modern forms of windows and other details, exhibit no vestiges of defensive galleries or other means of defense, and thus w will not indicate the condition existing in the 13 th century, but about that in the year 1500, as so expressly stated. But we may believe, that also for secure determination of this c condition do not suffice the oldest views remaining to us, t that about 1500 also after the campaigns of Maximilian must still have existed much of the old works, at least in ruins, that later disappeared, and therefore no longer appears in t the later ruins.

139. Marienburg.

Also the castle at Wiener-Neustadt was similarly arranged. The plans of the castles of the Teutonic Order all show four wings surrounding an inner court. Some indeed also have at an angle the great tower. It is naturally not surprising, that it did not everywhere disappear at the same time. The castles of the Teutonic Order were, so far as they were monumentally erected, just strong residences, which only bore means of defense at the edge of the roof and at the angles, as well as at the gates, stood in a ditch, so that together with their

outer works they appeared sufficiently strong. It was not intended for them to have an independent strength, but primarily that they should act with the outworks. The outer works indeed concealed the lower portion of the principal building. Thus the enemy from outside could only attack the upper part; but therefore batteries and defensive galleries also had their i importance, since from them the enemy could be struck. Particularly the old or principal castle of Marienburg that is marked III on the plate next page 136, and whose plan we give here (Figs. 123, 124) [173] at a larger scale (1 : 500), also shows this arrangement. This plan already shows, that indeed the w walls are massive and thick, but everywhere are opened by windows, even in the ground story. Great halls alternating with uith smaller windows rise in several stories, and aside from the entrance gate, it bears no longer a warlike character in the entire design, both in plan and elevation, until the battlements inform us that we stand before a strong house, whose occupants did not fera a storm, but did not intend to allow it to come to the house; for when an enemy apporoached from a afar, the archers commenced their activity at the same time as the defenders of the outer works, over which and forming a higher inner line their arrows were shot, as soon as they could reach the enemy.

Note 172. See Steinbrecht, C. Die Baukunst des deutschen R Ritterorders in Preussen. II. Die Zeit der Landmeister. 1230-1309. Berlin. 1888.

Note 173. From Frick. -- Also compare the plan restored by Steinbrecht for the time from 1280 to 1309 in Fig. 123 on p. 191.

Yet a few words on our plan. At the north angle is visible the manner in which the entrance is placed diagonally at the angle of the court; then is to be recognized the passage carried around the court, not unlike the cloisters of the monasteries. It may also be clearly seen, that the chapel of S. A Anna lying in the northeast angle is a later addition.

The great halls of the plan show, that the building has some affinity to our barracks, and since it would readily occur, that the men in a hall could go quickly into the court, they could not be hindered by exit doors; hence their great number in proportion to the stairways. When Steinbrecht proves that

originally the southeast wing was only a granary, he may be perfectly correct therein. Doubtless in the first construction all four wings were built in this manner, and only gradually followed a monumental rebuilding.

What we modern men miss is a stair hall corresponding to t the great plan. Men in the middle ages did not proceed so particularly. Stairways in any prominent plan are exceedingly r rare, and when also in France we know the grandly planned Louvre stairway, then in Germany in our knowledge no similar stairways exist. Here in the Marienburg it must be difficult to establish with ceatainty the original plan. In the later structure is indeed at A a stairway hall; but Steinbrecht in his plan of 1280 gives only some small connecting stairs placed in the wall. We shall receive in the later Heft, which will represent the buildings under the grand masters, still further explanations of this, and if we are permitted to prepare a s second edition of this work, besides many other improvements, we can indeed also work over this part to correspond.

We are now referred concerning the Marienburg always to the drawings of Gilly, Frick and Rabe, until the work to be expected from Steinbrecht will appear. What has appeared of this in the second volume of the work just mentioned, reached us after the illustrations concerned were already prepared. Therefore we cannot decide whether we are right, if we assume t that originally only one stairway was built in the cloister, and indeed in the south angle at B. but it could not suffice, if there suddenly occurred a great crowd, if a great number of men passed outward and others upward at the same time, each seeking the place assigned to him. Therefore already a second stairway was built in the opposite angle at A.

Reference should be made to the peculiar manner, in which the entrance to the rooms beside the Anna chapel is arranged by the passage in the thickness of the wall. The entrance to the Anna chapel leads into it at both sides from the enclosure: at the opposite or west angle in placed the arcade resting on piers, and that bore at its rear the defensive gallery, which led across to the Danzger tower. In Fig. 123 we give the plan of the second story of the northeast wing, which contains the chapter hall and adjoining the church S. Maria.

But if the forms of the older structure belong to the 13 th

century and were plain and earnest, so that this still always had somewhat the appearance of a castle, that was scarcely affected by the alterations of the 14 th century, then are the principal buildings of the middle or new castle originating in the 14 th century ostentatious structures, that in every tendency have laid aside the simplicity and earnestness of t the appearance of the older war structures. We reproduce in Figs. 125, 126 [174] the plan of the ground story, as well as that of the upper story of the portion containing the residence of the grand master, princely state apartments, that show their cheerfulness externally. The side of this building toward the Nogat and the side of the principal attack, that lay on the other bank of the Nogat shows afar, that men feared n nothing and could be alarmed by no enemy; even the massive a angle piers with their heavy projections beneath the battlements, as well as those themselves so decoratively treated, t that also by them the cheerful and friendly appearance was i increased, that the entire building produced, whose earnestness is only based on the great dimensions in which it is built, and which formerly appeared quite different from today, when the building was reflected from the water in the ditch, and still had its original roof with pointed roofs on the angle towers. The two lower stories, visible in elevation (Fig. 127) and section (Fig. 128), [174] are now partly concealed in the raised ground. The court lies so much higher, that the third story appeariug in our elevation is only the proper ground s story.

Note 174. Attempts at restoration from the drawings of Gilly, Bobe and Frick. (See Note 130, page 135).

There at A is the entrance into the frequently drawn and v very surprising great refectory of the knights, the "great r remter" (refectory). At B is a stairway in the wall leading to the second story as a connection with the residence of the grand master. An external flight of steps at C leads into an anteroom, and thence following the direction of the arrow at D into the passage to the grand master's residence; from thence two winding stairways E and F lead to the upper rooms and also down into the cellar. In the second story there interests us primarily the different internal communications, besides the two beautiful vaulted halls and the magnificent monumental

passages. The stairway F was that by which guests were led i into the upper corridor, from whence they were taken through the state doorway I into the proper festal room, the princely dining hall of the master. The stairway E was the inner connecting stairway, on which also the food was brought up from the kitchen, and taken through the passage H into the hall, from which was also the connection with the adjacent somewhat smaller hall. At G is a well. peculiar is the bay K, from which the grand master unseen could look down into the great refectory, and could thus oversee his knights. At L and M are entrances, that lead from the court into the lower stories.

What especially interests us is the construction of the defensive galleries. We see in our Fig. 127 flat arches connecting the piers. Between these and scarcely perceptible from t the exterior are great slots, through which great stones could be thrown down, which made it extremely difficult to approach the wall by boats, or on foot if the water in the ditch were dried out. Through the slots of the battlements men could shoot at the enemy, who were on the Nogat, but also first of all from one angle tower at those, who came across the bridge, and attacked the water gate. It appears that just for this t the entire building projected so much; for further could not reach even a crossbow bent by a machine. How the original construction was, we certainly do not know; but it was still possible to obtain nearly 6.6 ft. width for the defensive gallery on the long side, and on the towers resulted platforms about 16 ft. diameter, so that from thence could still be thrown p powerful arrows by machines, that dominated the river and bridge about to the middle. But if enemies were already within the enclosure, had crossbows sufficed for shooting arrows down through lower openings not visible outside, and for hindering the approach to the ditch. But also in the moment of a near danger it could not injure if windows enough existed, behind which archers with bows and crossbows could stand, even if not fully protected.

140. Schlüsselfelder House in Nuremberg.

In the series of strong houses also belongs the widely known Schlüsselfelder religious house, that stands opposite Church S. Lorenz at Nuremberg, [175] which was erected in the first y years of the 15 th century. It contains two stories below, t

that have been entirely rebuilt, of whose original form nothing is fixed, of which we even believe that we should assume, that in general these served only as a storehouse; for not merèly was the facade turned toward the cemetery of S. Lorenz; but also men would scarcely have proceeded later to such a t total rebuilding, if already earlier living rooms had existed. Likewise also in the arraugement of the stairways, as they o originally existed in the nearly square adjacent building, a all conclusions fail. [176] Just as little is known of where t the entrance lay and how it was built. The entire tower-like structure makes the impression, that it was already originally a portion of a larger design, although it maw be proved, that the two buildings adjoining at both north and west sides did not scarcely belong to it, but that even the one now belonging to it on the west side was only added later. Thus there exists no opportunity to mention more of the nearly rectangular plan, whose similarity to the residence towers od the earlier period (particularly that of Friesach) must at once vanish, than the beautiful facade treatment of the east and south sides. We r reproduce in Fig. 129 the east side, which otherwise with exception of the form of roof on the south front is similar, a and only has the charming little choir before it.

Note 175. Without any reason, but only in this century (19 th) it has received the name of "Nassau House."

Note 176. It probably lay at the west side between this and the adjoining house, only purchased later.

Of the two principal stories, as in the tower at Friesach, the lower is the house chapel, a great hall, that formerly h had painted windows, whose form and size are in part still c correctly visible by the transformations, that the windows ha have suffered iu our time. Heideloff, even if also incorrect, has held fast to the pointed arched windows in his publication. The little choir mentioned forms the altar room of the chapel: its spire is a lantern, that contained an ever-burning light directed toward the cemetery. As in the tower of Friesach, he here also over the chapel was a living room, above which was a defensive platform with battlements, to which are also added turrets at the angles. Although the liviug room was not vaulted, but had a beam ceiling, care was taken by a watertight covering, so that the roof could be removed from the defensive

platform, wherefore it is entirely detached from the lower c construction. Still existing water-spouts served to discharge the rainwater collected on the platform. The popular opinion that always knows how to correct everything in its own way, regards differently the watertight platform, and states that a fish-pond was in the attic.

141. Hochkönigsburg.

We have reached a point in our consideration, where we could properly close this Chapter; for according as the fortification of a house is so far connected with its comfort, as at t the grand master's residence at Marienburg, then naturally in the way that military architecture later followed, even the last remnant of the latter became useless. But this occurred only gradually. Still men ever busied themselves in transforming existing castles and palaces, and did not always go equally far in such transformations. Here and there men remained far behind what was done elsewhere, since changes in general always cost money. Also not everyone could favor the idea, that he could do nothing without a sufficient garrison; but w when one arranged for such, that not even a storm could be r repelled, and that he need not dwell in a tower, and did not require to entirely enclose his house externally.

Yet the principal building of Hochkönigsburg in Alsace, that first originated at the end of the 15 th century, and as the plan in Fig. 130 [177] shows, which groups its wings around a court like many other city houses, that will be mentioned in a later heft, it has not only spared the tower already existing from the earlier time, not only equipping its buildings - at least in part with defensive galleries and platforms, but also has placed relatively few windows on the exterior. It is still always a strong house, but what interests us particularly therein is not properly the fortification, which exhibits nothing new, since all that is new concerns the outworks. It is only questions of purely structural technical character of purely formal kind, that interest us on this structure, and therefore which we can consider better at another place than here.

Note 177. From drawings by C. Winkler, as well as the frequently mentioned writings of Viollet-le-Duc and Naeher.

142. Tower at Perchtoldsdorf.

142. Tower at Perchtoldsdorf.

The same also applies to all the other castles, and we can therefore close our Chapter with the presentation of a building, that occupies a quite peculiar position. This is a massive tower built only in the 15 th century and now detached, that rises in the market of Rechtoldsdorf not far from Vienna; a belated descendant of the old keeps and residence towers, higher than any of its true predecessors. (see adjacent plate). It formed a part of a greater castle plan, but indeed stood entirely distinct from that, projecting at an angle of the w wall enclosing the castle, and only connected with the other buildings by the crown of the wall, therefore being free. The entrance doorway in the second storw, the subterranean passage for flight, all recall the old time, also that a chapel occupies the second story, and above which are built the three p pretty living rooms. Indeed what purpose the high upper room with its church windows has, we cannot explain, and the open passage, that leads around externally shows only, that men no longer sought protection for archers (in any case already musketeers), if in general they thought of placing such.

The entire tower is only a piece of decoration. If generally one could doubt its age, still he must believe that a modern architect erected it, who had rather an understanding of romantic harmony, than of mediaeval military architecture. An e explanation of this we partly find, that in the examination of older buildings of every region similar towers are found, probably of earlier origin, arranged somewhat differently at the time of their erection. Thus the four towers of the Vienna castle, for example, which on the old views exhibit entirely similar galleries, but which as Leopold the Glorious built t them, may have been more like thuse of the Krak, as they appear in Figs. 55, 60. Also the battlements, which that tower may well have had and others, may have been of masonry, and such towers were also therefore mere ornamental pieces, that men held to be important for the character of a castle, and accordingly reproduced here as decorative pieces.

If we end our Chapter with this ornamental piece, then some reader may ask, why this or that castle was not given under the name, why this or that strong house was not mentioned, t that indeed is so widely famous. Now then, we could certainly have increased the series of examples by a good number; but

we should not have thereby gone substantially farther; for so many castles, so many individuals, eaah different from the o others, yet differing only in relation to combinations of the elements, differing so far as earlier motives are retained, freqaently retained very long and again repeated quite late. But many castles present therein special diffieubties, that parts from the most different times stand beside each other; but finally many right famous"castles"are so no longer, but are very peaceful buildings, that perhaps occur on the sites of castles, as for example, the Albrechtsburg at Meissen, tht no longer is a strong house, and therefore will be mentioned in the following Heft, although it lies on the hill and is t termed a"castle". Likewise the other structures, that stand in castles without serving the purpose of defense, such as dwellings and chapels, kitchens, etc., to be mentioned in o other Hefts of this book.

Chapter 11. Earthen Wall and Ditch, Walls and Towers.

143. Earth Wall, Ditch and Walls.

If we wish to study further the nature of the fortifications of the middle ages in regard to various details, then we find as the most important the particular enclosure of the entire area by earth wall and ditch or by a masonry wally. We have previously stated concerning this, that the ancient German m method by the excavation of a ditch and the use of the removed material for a wall, that received a breastwork of palisades, was continued deep into the middle ages, that if no soft ground but hard rock existed, men did not shrink to cut the ditch in the rock, and piled up the stone blocks removed in a wall just as one of earth. Since everywhere it was the endeavor to make the fortifications usable as quickly as possible, then everywhere the fortification with earth and wood was that first occurring, and only gradually originated instead of these earthworks or behind them massive walls, that gave a more substantial and more resistant fortification. This in part only ocurred quite late, and particularly our cities generally show no very old walls, and also their frequent extension made necessary frequent enlargements.

A difference is not to be made between the construction of a castle and a city wall. Where such exists, if does not lie in the different purpose, but in the advantages resulting from the form of the ground, or it is based on the lack of materials, that did not permit taking full and entire account of t the requirements of safety. Thus as already we have shown the walls of castle Arques (Fig. 17, p. 55), maw also have been those of many cities. As there were first constructed earth wall and ditch, to which were later added the walls, and only after the lapse of a longer time the towers, so was it also for most cities.

We have designated in Art. 15 (p. 18) as one of the oldest city walls that of Carcassonne; yet however only its foundation is so old; but it shows that the wall was originally strengthened by semicircular towers, that were solid below and adjoined it. But later at the rebuilding in the 12 th and 13 th centuries, this plan was retained; likewise the arrangement that each tower could be separated from the crown of the wall as a detached fort, appeared in this rebuilding.

We give in Fig. 131 the section of the wall of the Salzburg near Neustadt on the Frankish Saale, indeed the part beside the entrance gate.

This has a thickness of about 10 ft. and a height of about 23 ft.; it stands at a distance of about 30 ft. from the edge of the ditch, and it is still noticeable, that the slope of the ditch cut in the rock is continued as a wall above the ditch. It is therefore to be assumed, that a second wall, of which a few remains are still to be seen, surrounded the great ditch outside. This wall was crowned by palisades and in any case formed the original enclosure of the castle. At what time it was abandoned is doubtful. At the close of the 11 th or beginning of the 12 th centuries may have been erected the wall behind it. We have already said of it in Art. 55 (p. 47), that already in the 12 th century at certain places windows were opened in the wall, which reduced the safety and strength in the sense of that time, and must also have been considered in the erection of the walls and towers of an earlier time. Only the tower faced with ashlars with bosses, that is directly v visible on our section, belongs to the later 12 th century o onward, and was erected at the same time with the opening of the walls, since on both is found the zigzag astragal as an ornament. The battlements remain at only one place on the wall, and indeed with oblique covering of the verticals, such as is peculiar to the 14 th century. Yet its design, particularly so far as concerns the widths of verticals and of slots, still belongs to the earlier time. The wall required protection from the effects of weathering, and doubtless received this by a constructed roof, that also protected those on the wall. Towers of rectangular plan projecting from the wall are found o only on the northeast side, there being three of them.

144. Enclosures.

By the erection of the wall behind the earth wall there resulted what was later called an "enclosure" (zwinger), a special area for defense between two walls, the rear one of which is to be regarded as the principal wall and is higher, the f front one being lower. The chief purpose of this arrangement is that the besiegers could not so easily reach the wall proper with battering rams or rolling towers, but must already halt at the lower and outer wall, as well as that two rows of

archers behind and above each other would releive the approaching enemy. When for this area between the two walls the term "enclosure" (zwinger) arose is hard to determine, but manifestly only tolerably late. But the thing itself in any case g goes far back. Already the ancient German earth walls show p partly around, and partly in certain places are such earth walls before the main earth walls. Everywhere and at every time men sought to increase the strength of the plan by such external earth walls to at least leave a row of palisades at a certain distance outside the main wall. We have various earlier appellations for such outer walls, such as "hamit", "zingulum, the zingel."Schultz assumes that "zwinger" comes from "zingel."The French call the zwinger "lices", from the German word "letze". In the 14 th century occurs also the word "parcham" for this intermediate area.

A definite rule for the distance of the outer or enclosure wall from the principal wall behind is not to be found; the distance frequently seems considerable, particularly if, as at a castle, the main wall lay high on the rock and the outer line of palisades was drawn about the base of the rock. However every such enclosure requires the necessary men, and for lack of such one must have indeed been satisfied with a single line of wall.

145. Ancient Earth Wall of Cologne.

In the most interesting way the ancient earth wall of the city of Cologne [178] could be recognized till recently, that u until the close of the 12 th century formed the chief defensive work of the city; first from then onward, on this completely remaining wall was set the stone wall with its foundations sunk into it.

Note 178. See Cölner Thorburgen und Befestigungen. 1880 - 1882. Published by Architects' and Engineers' Union for Lower Rhine and Westphalia. 1883.

The earth wall indeed originally, accordingly as the ground itself presented elevations and depressions, had an average height of 20 to 23 ft. above the natural ground, about the s same width at top, and further about 23 ft. depth of the ditch, so that the height from bottom of the ditch to the crown of the wall amounted to 40 to 46 ft. In erecting the wall of masonry, on which work continued from the close of the 12 th to

about the end of the 14 th century, men set piers on separately sunk foundations, that stood about 26 ft. from centre to centre, were connected by arches closed by relatively thin e external walls. In the arched recesses of the wall were arranged slot-shaped openings for shooting. 179. On the arcade was the crown of the wall about 11.5 ft. broad, on which the defenders could conveniently pass back and forth beside each other. On the outer side of the wall it terminated in a series of battlements. This finally gave way to a different crown; yet still at certain places sufficient remains existed to give us an idea of it. At distances of about 229 ft. were inserted in the wall projecting semicircular towers open at the rear. Also slots occurred in the half towers. In the thickness of their walls were stairs that led from the earth wall to the crown of the masonry wall. The height of the towers exceeded that of the battlements by but a small amount; a passage through the tower connected the crowns of the parts of the wall, that lay at both sides of them. We can assume that this system was established at the close of the 12 th century, and it was retained so long as work continued on the wall. As material served basalt prisms left in their original form, that were employed partly as stretchers and partly as headers. extending through the entire thickness of the wall where possible, and between which were employed regularly cut tufa blocks, p partly forming regular courses, partly also composing connected parts of the wall, indeed if the basalt material did not exist to correspond. If the wall must be permanently preserved without causing the cost of continual repairs, a roof must be built over it, which could be so arranged, that also at the time of combat it would not hinder, and in bad weather would protect those remaining on the wall. On the old towers, that by the slight excess in height were not in condition to afford substantial protection to the crown of the wall itself, we h have to conceive still a projecting wooden story, from which arrows could be shot to all sides. These towers had particularly the problem of receiving an enemy, that approached the wall, and if he was already at its foot, to effectively fight him from two adjacent towers. But their own feet must be protected, that could be done by a projecting story. The outer side of the ditch was also originally inclined. At a later t

time in place of the slope appeared a retaining wall, so that only the great slope was at the foot of the wall. First in t the 14 th and 15 th centuries was arranged a second similar ditch outside the first, separated by a small interval.

Note 179. They did not originally exist in the older portions and were only added later, but may at once have been constructed with the later wall. The same may be true in regard to the slots in the towers.

The retaining of the inner earth wall and placing of the m masonry wall thereon naturally produced a quite imposing height for the entire arrangement. Since the wall has no deep f foundations, an enemy could succeed in excavating a passage beneath the stone wall through the earth wall to the interior, and we indeed know of an attack, that at the beginning of the 13 th century was attempted in this way at the south side of the city, in which only the wacthfulness of the defenders prevented the entrance of the enemy through this breach.

On the adjacent plan is represented a portion of the wall of the southern part of the city after the drawings by Wiethase and the restorations there given. If we had to make such, we should give the tower a battlement cornice, that still must be in place for the 12 th century; still even most of the towers were only built in the later time. In Carcassonne, where similar semicircular towers already stood in the Visigothic, perhaps also in the Roman walls, not only are recognizable b battlements, but also clearly the separation of the different towers from the crown of the wall, with which they are connected by a bridge, that could easily be removed, as at the tower of the Salzburg.

We shall call attention to only one, and then refer to the Plate adjoining page 212 (section). After the wall had once been erected on the earth wall, this hardly retained the top of its upper natural slope on the exterior of the stone wall; indeed it formed entirely by itself a small wall crown at the base thereof: this furnished a footway around the stone wall. If this were protected by a breastwork of palisades, then could it still do good service for defense. Access could easily occur from the wooden defensive galleries, built on the connecting passages, that from the gate towers extended to the outworks, as represented on the illustration mentioned.

Already the Romans placed both rectangular and semicircular towers at such distances it its walls, allowing them to project, so that archers placed in them could sweep the entire foot of the wall between each tow towers, and so could make it impossible for the enemy to establish himself at the foot of the wall. Indeed we find consistent use made of towers only in cities, which had at commend sufficient men also to garrisson the towers well. In castles these were frequently lacking, since sometimes the inaccessibility of the precipice of rock made it superfluous to particularly care for the foot of the wall, but then also because the men were not at hand to man them. The example of the Salzburg shows, that also in cities, where conditions permitted, men knew how to prize the wall t. towers.

For what concerns the form of the towers, there also occur beside each other in the middle ages the two forms common to the Romans at all times, and it is not established, that under definite external assumptions men preferred one or the other form, or that the contrary is shown by certain countries and schools. We find both forms during the entire middle ages occurring beside each other.

146. Walls in Tortosa.

Like all military buildings of the crusaders in the Orient, so also the doubled towers reproduced on the adjacent plate of the previously represented castle of Tortosa in Fig. 51 (p. 103) are of far greater dimensions, than all similar buildings of the West. In particular the great and deep ditches, that are cut in the rock, nearly to the surface of the introduced sea water, on their external side as a continuation of the walls and towers rising above them, are lined with ashlars with bosses, entirely surprising. The ashlars with bosses are of large dimensions, more than in our German buildings, and substantially contribute to the grandest expression of the a appearance. The inner walls, which in any case Wilbrand of Olden burg already saw in the beginning of the 13 th century, even if perhaps also not in its later height, was here the h height of the towers and not merely a defensive gallery on t the crown of such a width, that even machines for casting arrows could be placed there, protected by a wall with nearly square openings, but also with a passage below them, that ex-

extended through the entire length of the wall, and could serve both for crossbow men as well as for archers, who stood b behind the row of longer slots, which permitted from this passage a formal shooting of near enemies with rapidly shot arrows. At the foot of the wall was found in recesses a second r row of such slots, behind these being vaulted structures, that perhaps first belonged to a later time; they formed a substantial support of the high wall; their platform may have borne casting machines, that slung far-reaching great balls upward and over the wall. [180] There may be clearly recognized from the adjacent plate the importance of the projecting towers, t that also have slots in their sides, by which if the enemy h had reached the wall, he could be effectively fought through the sides.

Note 180. Also otherwise, as in the Louvre, is mentioned th the placing of such machines in courts in places where direct aim was impossible.

We have before stated, that probably in the beginning of t the 13 th century only the inner wall stood, and that the outer one with its towers was only added in the course of the later one. Possibly the inner one was also first raised then, in order to be able to shoot over the outer one at a corresponding height. A moulding that lies just at the height of the passage, the probable original crown of the wall, would otherwise have no meaning. To establish the external line of defense, there was first cut a second ditch in the rock and leaving the wall, then a second rather lower wall was placed on t the wall, likewise furnished at its base with recesses and s slots for shooting; it had a height of about 20 ft., and was then coowned by a battlement wall 13 ft. high with rectaugular window openings. On it could thus stand two rows of defenders, over which also if the enemy came too near, the defenders of the inner wall in two rows could send their arrows. But the defensive platforms of the towers were spacious enough for t the great casting machines. Certainly archers, at the great distance of 164 ft. of the inner wall from the outer edge of the ditch, could scarcely have produced much result; but on the other hand the question of the inner wall was entirely a able to command the outer one, in case this was taken, and the enemy desired to establish himself there.

147. German City Walls in the 14 th and 15 th Centuries. Essentially simpler in form was the system, according to w which the German cities constructed their circuit of walls f from the close of the 13 th to in the 15 th centuries, corresponding to their means and their defensive strength. The comparison of the walls of Nuremberg, which as a characteristic example we can place beside those of Tortosa, show this surprsing difference. We have stated in Art. 33 (p. 35), that at the close of the 14 th century the construction of this wall was begun, and we have given in the plate next page 34 a general view of the city fortifications. We show here on the adjacent Plate a part of the enclosure of the south side, indeed that directly before the Carthusian monastery. When the system was fully established, indeed firearms were already in use in Nuremberg. But they were still so little developed, that they were not employed generally in defense, and the walls were also not arranged to resist artillery. But the arrangement was found, that a greater number of men could already receive the enemy with shots on his approach. Principally here may the c crossbow have been intended as the weapon, in whose place also firearms may have appeared separately. Great casting machines found their places in the outer enclosure.

As everywhere, so men first sought here to establish a simple enclosure as quickly as possible, which was then gradually strengthened, until at last the city ditch, probably at first narrow, was excavated and finally received the great width, which still surprises us today. Then passed a series of decades;:but there is scarcely any doubt, that perhaps excepting a few details, the entire plan was already conceived in the 14 th, as it was executed in the course of the 15 th century. Men first appear to have begun to build a simple wall about 3.3 ft. thick, that had different heights at various places, but 23 ft. as an average. This wall originally had no strengthening piers, as one can still see on a small piece north of the Spittler gate, where also the inside face is dressed even and plain. But certain headers project, that allow it to be seen, that men already then designated the places at which should later be built the piers. Then these were constructed nearly around at about 20 ft. between centres, with widths of 3.9 ft. and projections of 2.5 ft., a base projecting 0.7 ft. The pi-

piers aee connected by round arches with masonry spandrels.

The crown has a cap projecting at both sides, thereby a breadth of 5.3 ft., of which however one foot goes for the battlement wall, whose thinness is the more striking, since men already had to face cannon balls. The nurembergers knew well, that the neighboring nobles, that even their constant opponents, the margraves of Brandenburg, possessed few cannon. The battlements were partly constructed of ashlars, or made of bricks in certain places. The verticals had a breadth of 5.9 ft., the spaces being 2.0 ft.; each vertical had one slot; t the total height of the battlements amounted to 6.6 ft. For protection against the effects of weather a roof was placed over the battlements, that formed a covered defensive gallery.

At distances of about 164 ft. rectangular towers are inserted in the walls, that projected inside but little, yet strongly outside, and have about 20 ft. width. One story of these is level with the crown of the wall; over it are mostly two and in part also three others; the lower part of the towers to the height of the wall is divided in two stories, the lower one of these indeed being very low.[181] Altogether 4 rows of archers could stand in each tower. It is characteristic, t that the towers at both sides are connected by great doorways with the defensive galleries of the walls, so that connection through the towers was least obstructed. The idea of making each tower a separate castle, that like the principal tower of a castle must be separately besieged, just as this was the endeavor in the towers of Carcassonne, is dropped, since the enemy would scarcely have done this, and because the interruption of the crown of the wall at each tower would have obstructed passage in the defensive galleries, so that in the moment of danger this might be fatal. Access to the crown of the wall therefore occurred through the towers,[187] each of which had in the ground story an entrance doorway from the city, a and in the interior was only obtained by ladders, instead of which later very bad stairs were found. A little bay at the side of each tower with open floor contained a privy, evidence that in these towers at least some men remained permanently. Later the towers were also furnished with chimneys and could be warmed; on this occasion also most of the slots were changed into small windows. Certain towers show, that they were

originally open at the city side. But most were already originally closed by a wall with little windows, which however e everywhere had only about half the thickness of the other three walls. Battlements appear to have never existed on these towers. The adjacent plate shows in the internal elevation the low r roof of the tower, just as now the towers of the region are covered almost without exception, while in the other elevations the roof is drawn after an older construction found in t the vicinity, as several such are preserved. The closed dormer windows, as well as the two adjoining openings, allow some a archers to be placed up there. While the construction of the bay of brick masonry permits the conclusion, that this tower was built in the 15 th century first, there is a number of others in the circuit of the walls, that at the edge of the roof only on the outside have two stone angle turretr, that serve as sentry boxes for one man in each, and at the same t time besides observing the vicinity, made also possible the sending of arrows therefrom. (Fig. 132). These may have been constructed even in the 14 th century.

Note 181. According to the location, there occurs some variety in these.

Note 182. meanwhile at certain places are also flights of steps outside the towers, that lead to the crown of the wall.

Before the wall and towers was then an enclosure averaging 56 ft. wide. When we see in Tortosa that this is divided by t the ditch and is only very narrow, and that also a high wall stands before it, then we recognize at once, that casting machines could not so well be placed there as in the wide Nuremberg enclosure. But at this also only one retaining wall existed and no other high wall, so that the casting machines indeed could be seen from outside, but also the men serving them could see directly just where they had to aim their machines. Movable wooden walls gave sufficient protection. Thus the wall of the enclosure is replaced by simple battlements on the retaining wall. Only a few remains of these battlements still exist; but they allow it to be plainly recognized, that the construction was exactly the same as that of the upper battlements, so that we can also assume, that likewise a wooden defensive gallery protected the masonry, i.e., even a roof.

In our representation of the condition of the city wall of

Nuremberg, as it existed in the 14 th century, no parapet wall is assumed on the outer side of the ditch. This external side was that approached by the enemy; means of protection, so that he should not fall into the ditch and injure himself did not pertain to the defense; but still less would one afford him t the opportunity to shelter himself behind such a wall. But t the proper inhabitants, who went into the open before the walls on Sundays and festival days, must themselves take care, that they received no injuries. Meanwhile yet appear here and there to have existed such protecting walls. Yet this always indicates according to our opinion, that not merely before th the gates still existed outworks, but that these were also c connected by walls, ditches and rows of palisades.

Substantiallw this system was now carried out iu all city walls of Germany, so far as the cities could raise the means for it.

Where this was not the case, men contented themselves, as it might be, only wit the thought of executing them as soon as the means would permit. We find here and there relatively low and in part quite thin walls, whose crown was too weak to place a defensive gallery thereon; indeed these must also occasionally be strengthened by piers and arches, and thus afforded a sufficient breadth for the defensive gallery. But till this was possible men aided it by heaping earth or by a wooden framework behind the wall. Our succeeding illustrations, particularly the representation of the gates, show some cases of this kind. Thus for example, we give below the water gate at Tangermünde, of which we know, that it had an outwork, which at both sides was adjoined by a wall extending before the city wall, that formed an outer line of defense outside the ditch. The city wall itself, although formerly adorned by battlements, is there so thin, that it could only offer resistance, wheu inside at its base was a great bank of earth, and a wooden scaffold presented a defensive gallery, on which the defenders could act.

Fig. 139 shows beside the tower, on account of which it is given below, another interesting part of the city wall of Lucerne. Not everywhere do the walls run horizontally; in part they make more or less considerable inclines upon the hill. When this occurs, the crown of the wall extends in a ramp; b

but where as here the inclination was too great, the crown of the wall forms a series of steps, which are protected by a c covering outer wall in great offsets.

148. Wealth of Forms in the Later Towers.

In the treatment of towers of the 14 th and 15 th centuries developed a lively sense of form. Simple, we might almost say insipid forms of the Nuremberg towers are shown especially by those of north Germany, permitted there by the development, which there adopted construction of bricks, after truly fantastic forms. But also other regions, thus Bohemia and particularly Prague, exhibit in their towers a development, that p permits seeing,that they are rather ornaments for the decoration of the city,than military structures for its protection. Also in the waves of the Rhine are reflected towers -- we recall only those at Oberwesel and Andernach -- that are indeed still fortress towers, but which one clearly sees, that they were not merely to protect the city, but also to please the inhabitants, first of all to permanently impress the view of the city on those passing by it. As military structures they show us little new. They will be mentioned in speaking of the gates, since just their towers afford opportunity to emphasize these peculiarities. Here will we recall some, that indeed a are less capricious but are typical of them. Thus Fig. 133 [183] shows us a semicircular tower from Aix-la-Chapelle, which is very characteristic for the towers of this plan in the later time.

Note 183. From Bock.

As beside the rectangular we also find round castle towers, so do we also find full circular towers in the walls of cities. A tower in Gransee (Mark Brandenburg) may in its plan even go back into the early time; it was even a castle by itself, without any passage for connecting the crowns of the walls separated by it. (Fig. 134) [184] Like a castle tower, it has its entrance high above the ground; but the upper part with its richly animated battlements even belongs thus to a later time, to the close of the middle ages, like the upper openings for small firearms.

Note 184. From Adler, Pl. 77. The entrance now existing in the ground story was naturally only opened later.

A smaller round tower, but which by its location is import-

important for the defense of the city is the small Cunibert's tower at Cologne. (Fig. 135). [185] Belonging to the 14 th century, it also originally had only slots at the places, that later received windows. The series of battlements surrounding the tower rests on a row of corbels, that are connected by or- ornamental arches; a pointed roof, such as must have existed according to the analogy of other towers, the little tower ap- appears to have never had.

Note 185. From Wiethose. Pl. 51.

We cannot here refrain from also again returning to the form of the two towers, which decorate the main structure of the castle Ehrenfels, and with the exception of the roofs are yet preserved. We have previously stated (Art. 136, p. 178), that in the 13 th century quite simple projecting wooden framework extended for the defensive gallery, and we have so represented the towers on the plate given there. There is also added in dotted lines the form and size, that one tower received later. These roofs, whose form may be recognized with undoubted certainty from the older copper engraving mentioned in Art. 107, (p. 134), show that also on the Rhine such were native, and a glance at Fig. 77 will at once justify the expression "ornament", which we have just employed, but will also show, how much allied one of the towers is in form to the Cunibert's t tower in Cologne. The transition from the round to the octagon, the projection of the upper beyond the lower part, which is too small, for the proper needs of fortification to require, indicates that just as the four little bays at the edge of the roof of the second tower, that the architect io determining its forms rather came to producing an artistic effect, than to increase the resistance.

149. Introduction of Artillery in the System of Defense.

Firearms developed in the course of the 15 th century to e ever greater importance, and soon the advance allowed, that they were called as an important means of defense to take a determining influence on military architecture, never to be rejected. In Nuremberg first one change after another was therefore made in the old fortifications.

Men may first have attempted to insert large guns in the slots of the battlements of the outer enclosures, that in the 15 th centurn the nature of the shooting had made so wide, t

that they might be employed with results, so that guns are f found in place of casting machines. But in general the first influence of the use of firearms shows itself in a series of towers, that in the city ditch are mostly attached to the retaining wall only in its own height, and without needing to be particularly large, they first of all had the purpose to cover lengthwise the city ditch itself, and thus to hinder t the enemy from building a causeway therein, then being able to penetrate into the outer enclosure. First with the close of the 15 th century men proceeded, removing the old battlements of the retaining wall of the enclosure aud giving it a crown raised about 6.6 ft. above the glacis, that contained embrasures for large cannon, but at the same time was strong enough to resist a stone ball coming from outside. It may already fall in the 16 th century, that also the upper stories of certain towers were furnished with embrasures.

With the introduction of guns and their establishment behind the wall of the outer enclosure, this became the main line of defense, which even had the main problem, to not at all p permit the enemy to reach the wall. This purpose also was served by small towers like bastions, that were intended at places where the enemy could not merely move in a line against the wall, to maintain a strong fire toward all sides, by which both the ditch at both sides was swept, and also the different points outside could be struck. The oldest tower like a bastion of the Nuremberg wall appears to have been that, which s stands in the vicinity of the little Heller gateway, and indicates a development of the semicircular tower of the earlier period. We give the plan in Figs. 136 to 138, the outer elevation and the section of this interesting little work.

The lower portion of this, that corresponds to the depth of the city ditch is simply filled. At the height of the enclosure then is a low story with 5 niches, each of which has an e embrasure for a small gun; under the roof are arranged holes to allow the smoke to escape, that must rise from the touchholes of the guns, even if the mouths project from the opening. Already it was possible from this lower story to shoot over the outer wall of the city ditch. But that itself could not be commanded from it. A second storw lying above, whose rear was at first entirely open, has similar recesses; the openings

for the mouths of the guns point slightly downward. Below these are however found a second one for each, directed downward in the floor, by which with inclined position of the gun it was possible to strike the city ditch. Remarkable also are t two small L-shaped openings beside each of the upper embrasures, which served for sweeping the vicinity with muskets, while the cannon of the embrasures reached somewhat farther, a and the great guns of the crown of the wall should reach the enemy before he took position before the walls of the city.

The efficiency of this bastion tower may have been comparatively good; for a series of similar ones exist, by which it is attempted to increase the effect by development in details. Particularly is the lower part, here filled, also hollow and furnished with openings for muskets and small guns, in order to command more effectively the city ditch itself, etc. Meanwhile still larger cannon could not be placed in such towers, and in the vicinity of the Spittler gate, at the now so-called Kocherts enclosure, is arranged a great circular bastion of a about 66 ft. diameter enclosed by ashlar walls, but entirely filled with earth, on whose top about 39 ft. above the bottom of the city ditch, but only about 13 ft. above the external ground, a number of larger cannon found places behind massive breastworks, able to direct their fire to all sides. Such b bastions now form the basis of the further development of the mode of fortification. On rectangular plans they first appear on the illustration of the Paris Bastile, that we give later. Merian's view of Lubeck shows similar round bastions, standing there more or less independent, like that at Nuremberg. In t the same indicated sense, not merely offering a platform but with several stories, yet without being developed in form of a tower, appears the bastion of Montbeliard, that is visible in Fig. 9 (p. 38), is not solid but hollow, so that it affords in its interior rooms for cannon.

However the tower was not to be supplemented entirely so r rapidly; not merely were older towers transformed; men also built similar ones, like the semicircular mighty round towers with such thickness of walls, that they were held able to resist even the balls from larger cannon mounted by the besiegers, and thus to protect their own artillery. On the view of Lucerne, that we gave in Fig. 11 (p. 40), such a round tower

stands at the foot of the hill on the Limat, which we reproduce in Fig. 139 [186] at a larger scale. The wide embrasures of the upper story allowed each separate gun to point over a considerable area, which it might cover, and since the embrasures extend in a circle, and as the sidewise scope of each reahces into the area covered by the adjagent guns, then by this tower was dominated a wide circle. Likewise the defensive platform could receive guns, and if in spite of these the enemy had c come nearer, he could be attacked by men behind the battlemets with crossbows and muskets.

Note 186. From Mitt. d. K. K Cent Comm. z. Erf. d. Baudenkmale. 1867.

We may well say, if we consider the bastion at the Kocherts enclosure in Nuremberg, whose plan even falls in the time of the emperor Maximilian I, who must be regarded for Germany as the founder of the method for artillery, than the round towers of Lucerne, when we see that the two do not stand together, that these two principles contend with each other. Still about the middle of the 16 th century men believed, that the greatest possible elevation of the batteries must increase their e efficiency, and built the four mighty round towers of Nuremberg, in order to place the guns as high as possible. One of these towers stands almost directly beside the bastion mentioned, as if it must command this, and this 20 to 30 years older structure forms the starting point and the basis of the modern system of fortification, and the so pretentiously represented towers were indeed the last of their kind, so that no one that treats of the military architecture of the Renaissance period, to which they indeed belong, has occasion to speak of them; so it should be excused that we have mentioned them here. Tradition designates them as works of Dürer, who in correspondence with the great Italian painters had thoroughly acquainted himself with the art of fortification; but not only is it entirely certain, that they were erected only after his death by the architect H. Unger; his book on the art of fortification also contains nothing similar; it stands so strongly on the ground of the new time, that without going out of our problem and far beyond its limits, which is here our topic, t that we must no longer consider it.

150. Development of Walls not intended for great Cannon.

150. Development of Walls not intended for great Cannon.
Until at the close of the 15 th century, and even in the 16 th, however important the development of the system of artillery had become, this had not won the exclusive supremacy. Besides the artillery, that preferably served for separate w works, like the bastions mentioned and round towers, and then the walls of enclosures, still the former principal wall rising behind these always retained its garrison of archers, that with the crossbow, which had attained new importance at that time by the introduction of the steel bow and stronger cranks for straining, might suffice pretty nearly as well as the muskets, although under Maximilian I also the common muskets as well as the somewhat larger small guns first became effective and reliable weapons in war. By the development, which both the crossbow as well as the musket had taken, also a transformation of the wall with its defensive galleries had become n necessary, for which preparation had long been made. Already with the close of the 12 th century by the introduction of t the crossbow, the battlements had properly lost their importance. In spite of the added wooden shutters, of the slots m made in the verticals, there was already no longer any ground for retaining this form of protection for the archers standing behind it. Alter no attention could longer be paid to this, to receive with the sword at the open breastwork the approaching enemy clambering over the wall or on towers rolled up, or or still with toil and necessity, casting stones or boiling water over the breastwork, or through slots down on the enemy at the foot of the wall, the form of battlements no longer had any importance. Already the shutters, when and where they may have first appeared, had removed the importance of the battlements, and it is merely an indication of how conservative the entire world is, that this form was still retained for castles, since men saw in it just the characteristic of military architecture.

In the buildings of the crusaders we therefore already saw instead of battlements openings like windows and slots in the passage within the wall beneath the crown. But first with the close of the 15 th century in Germany the battlements became more rare, and in their places occurred in the defensive galleries openings like windows, but also slots in the deep cour-

courses of the wall. According to the location of the defensive galleries where these enclosed by walls, not merely outside but inside. A very interesting example was found on the now unfortuately destroyed outer wall around the place of arms before the Laufer gate in Nuremberg, whose section and internal elevation of the wall are given in the adjacent plate.

Note 187. The plan follows later (in Chapter 13).

We then have there at M the inner city wall, at N the outer or enclosure wall, before it the city ditch and at O is the external retaining wall of the latter. The wall M was built according to the ordinary system, yet had only 16 ft. height above the street level, since in excavating the ditch, that first occurred long after the erection of the wall, a part of the material from it was employed to raise the ground inside and outside, so that a portion of the city wall came to be in the ground. The defensive gallery was open toward the city, had a thin ashlar wall on the exterior, yet no battlements b but formal windows. We believe that it is to be assumed, that for elevating the wall originally was still left a small ditch. While then around the city the enclosure wall even at the close of the 15 th century was but little higher than the top of the city ditch, just as much as was necessary for the guns, at the places of arms it was raised to the same height as the inner wall. The betaining wall itself was composed of several walls standing before each other, in order to lessen the effect of the cannon fired against it. Each of these walls consisted of piers and arches, that were so arranged, that they did not touch each other. The outermost wall formed only one facing irregularly bonding in its separate stones. In this manner was it possible not only to give a certain elasticity to the wall backed with earth, but also maintain its position, at whatever place the enemy might ever attampt to breach it by shooting.

Above the ground the wall had great niches inside, in each of which was found a smaller one with an embrasure (B). The defensive gallery A, furnished with walls and windows at both sides, had a clear width of 9.8 ft., so that it might receive small guns. But that men always still placed value on a temporary wooden structure on the exterior results from the fact, that outside each niche two corbels project from the wall and

within each one are found two holes for bars, so that a framework, as at C, could be constructed, that not only afforded space for a row of musketeers, but also permitted stones and the like to be dropped on the enemy, who undertook to act in the old way at the foot of the wall; for so long as an attack made in the old manner was still conceivable, must one also be able to defend himself against it. An enemy that had broken away the upper part of the outer retaining wall of the ditch, and had thrown the mass of earth x y z down into the ditch like x'y'z', would already have had a quite convenient w way into the latter, and thereby one to the foot of the wall. From the defensive gallery A alone this could not be prevented; the effect of its small guns was here at a distance, about wiwithin the natural lines of fire c d. Fro B outward could be swept the opposite half of the ditch as about x'y', as well as x y above the ditch, although the latter offered some difficulties from the construction of the entrances. The row C of musketeers was therefore of greater importance, since they had a far greater field for their shots; they could still strike beyond d of the line of fire A. The musketeers could sweep a anything lying within reach from B, and alone hit the half of the ditch on this side behind the line of fire b; they alone could command the foot of the wall. Although the gallery no longer existed, since the entire work was torn down about 10 years ago, there were found the outside corbels and the beam holes also still at the middle of the standing towers the turrets, from which these external galleries were accessible. On the similar works of the Spittler gate, which more fortunately are not yet removed, although changed, are still found suspending irons instead of stone corbels, on which a similar construction could be erected. While the lower part, thus the niches B, was open inside, so that an enemy who had burst through the gate, and had reached the inner court, could not conceal himself therein, so long as he could still be fired on from the inner city wall; if the upper defensive gallery also inside, since it had connections at the sides with the defensive galleries of the inner wall, so that it must participate in fighting from all sides the enemy, that had entered.

We close the consideration of wall with the example of an entirely light and small enclosure, such as we find tolerably

often around isolated farm courts, cemeteries, etc., as we a also likewise frequently see built small outworks, connecting works, etc., walls with scarcely 1.6 ft. thickness, mostly but little more, and 10 or at most 13 ft. high. Fig. 140 [188] shows the section of such a wall in S. Martin on the Dux (Carinthia), and also teaches how there in a simple way a covered defensive gallery is formed, from which one could receive guests, who approached without invitation. In this manner indeed during the entire middle ages was transformed every simple enclosure of any area into a fortress, as soon as it became necessary to defend one's self behind it.

Note 188. From a publication of the "Wiener Bauhütte".

Chapter 12. Gates.

151. Gates of the 11 th and 12 th Centuries.

To each fortress, castle and city, the gate formed the natural entrance, through which friend and enemy sought to enter. However willingly men permitted the former, so the more certainly would they exclude the latter, and thus men heaped around the gate obstructions of every kind and means of defense against an attack. All roads led only to the gate, while around the walls the vicinity was made as impassible as possible by earthen walls and ditches. Therefore the gate was also the most natural point of attack; but therefore also were there the best means of defense, so that also the attack there became more difficult, than at any other place. Each gate was a castle in itself. We refer to what we have said previously on their access and gates in the description of different castles. As there men added one obstruction after another, and beginning far outside, arranged one work after another. Similar was the case for cities, where far outside one outwork was built before the other, each of which was a larger or smaller castle, only differing from an isolated fortress in that the traffic passed through it. In Fig. 131 (p. 191) we have already illustrated the walls of Frankish Salzburg, as they are shaped beside the entrance gate, thus at the same time giving the side elevation of the gate; here we represent (in Fig. 141) the external elevation of the gate towere. We must doubtless assume, that before the wall and beyond the ditch additional external lines protected the castle from the ridge of the hill, each of which had its gate, and that an outer castle lay there, which one must pass through to reach the gate of the castle itself. Meanwhile we can look away from this a and regard the opening leading through the external wall as the first gate.

As of almost all early woodeu constructions also no vestige of this is longer preserved. Yet we place before ourselves t the simplest possible closure. Over the ditch led a bridge; this bridge must not be a permanent one; it must easily be quickly removable entirely or at least in part, so that passage could be interrupted, if the last defenders of the outworks had retreated, and the enemy would enter. The bridges were therefore of wood almost without exception; only occas-

occasionally are found stone piers on which was placed the w wooden bridge. Such wooden bridges could easily be broken down, and if time no longer sufficed for this, could be destroyed by fire. Meantime indeed, if a combat arose on a bridge, so t that the time was too brief for that, certainly men had therefor already conceived a construction at a very early date, by which in a moment a portion of the bridge could be removed, and thus a gap could be suddenly created, men later employed for this drawbridges. The part directly before the gate was removable and could be raised.

But unfortunately there is lacking for us reliable statements of their existence in earlier, but also just on their occurrence at any definite later time. Therefore we can blame nobody, if he believes, that this so important a means of security must have already existed early, and might doubt, that any one is right, who assumes that only late did drawbridges come into use. [189] We should like to believe, that there and then at some definite building they did not exist, but that they should not be employed at all, we can believe impossible, and if also in Fig. 131 we have not shown a draw or shore bridge, we have them intentionally in various illustrations, to show that we believe in their existence in the early tice, b but therefore without wishing to assert, that this was the c case just in the example, to which we have added an attempt at restoration. But still less would we desire to say, that it must have been just so, as we have restored it after later examples. Intentionally in some representations have we p placed the movable part of the bridge not at the end, but in the middle of the bridge, and also have given several movable parts to one bridge (Fig. 39, p. 79).

Note 189. The enclosure of the Severin gate at Cologne, from the beginning of the 12 th century, leaves no doubt, that there was arranged a drawbridge. (See Wellhose, pl. 7).

After this digression, if we return to our Salzburg, then in Fig. 131 (p. 191) the bridge first leads us into a little forecourt, that is surrounded by walls with battlements. Also nothing of this forecourt exists; but remains of later buildings permit the conclusion, that they occur only in place of earlier ones. In any case ar entrance into the passage behind the wall existed there. The proper gate to the castle is found

in the tower, that externally, now where nothing more of the outwork is to be seen, presents the appearance represented in Fig. 141. Indeed it now only extends to the line A B, the upper part being restored. The gate was closed by thick wooden leaves, behind which bars offered further security. The interior of the tower is unfortunately entirely destroyed, so that it cannot be determined with certainty, whether a portcullis existed.

If an enemy had reached this, then the way stood open into the first court of the castle. The tower had not merely a great gate at its rear corresponding to the entrance gate, but also little doors at the sides. Certainly the defenders would have placed themselves in a circle around the tower, in order by personal combat to defend against the enemy the exit from the tower, and at least to hold him fast in the tower hall, whose formerly existing vaults doubtless had an opening, through which the garrison of the tower could shoot from above the enemy held fast in the hall, and pour liquids on him.

The entrance to the upper stories of the tower, as in the principal towers, was placed over the hall, only possible by means of a ladder; it lay at the side at the height of the c crown of the hall, but did not open on that. To produce a connection of the two defensive galleries through the tower must be constructed movable wooden bridges, that could be moved a aside, so that the tower stood just as independently as a principal tower, and the garrison could maintain itself therein, even if the enemy had penetrated into the court and even had taken the wall. It originally numbered between the lower hall and the defensive platform three other stories, and the defensive platform allowed, if we assume that the roof above it was furnished with slots, the garrison to hold out in a f formal siege, and could greatly injure the enemy, until the tower had fallen.

If we cannot also consider the frequently very peculiar plan of the entrance of every castle, yet we must still recall that of Landeck, which in Figs. 94 and 96 (p. 157, 158) we have r represented at a greater scale in connection with the principal tower, as on our general view of the castle in Fig. 31 ((p. 71). We there called attention to the way, that led from work to work, from gate to gate into the castle court, and i

its defensive measures, if we regard the construction of ashlars with bosses as belonging to the change from the 12 th to the 13 th centuries, and not as additions of a later time.

In general was sought, so far as it was usually possible, to keep the way into the gate itself as long as possible within the reach of the shots, casts and pourings of the defenders, and thus to carry the road to the gate along the defended wall and past as many towers as possible. An example of such a long route into the gate itself is afforded by the entrance to the Krak, that great fortress of the heights of S. John, that we treated iu Art. 39 (p. 107). The reader will compare the plans given there (Fig. 54 and the view (Fig. 55), that we follow here in Fig. 142 [190] with an enlarged plan of the entrance.

Note 190. From Rey, p. 47.

We have little information concerning non-monumental works; we find simply at not quite inaccessible places in a tower at A a small portal by which one entered, which certainly was o observed from a bay over it, and could be prevented. The portal led into a vaulted hall and through this into a long passage B like a tunnel, partly cut in the rsck, partly built of ashlars, in which a few men could make all passage impossible. At b one had ascended so high as to find himself under the o open sky. The way theu led again into a little hall before t the tower 8 to B', uhere he again passed underground further, in order at F to reach a gate provided with a portcullis, and then under the building at I into the court. It is easily apparent, how difficult this passage was to fight through, but also just as readily, how slowly a garrison outside could retreat through the narrow passage, but how slowly also they c could pass out, if they desired to act outside. The entire p protection consisted in the ease of holding the narrow passage.

152. Bridge Gates.

A special development was received by gates, where they stood in connection with stone bridges. We have in germany several monumental bridges of an earlier time, of which we regard the Danube bridge at Regensburg as the greatest and most important; however it is just at it that the gate leading through a tower is somewhat less developed in its further plan in consequence of the small space at command, than is the case at some French bridges.

Meanwhile we refer to the Art."Pont" in Viollet-le-Duc's D Dictionnaire raisonnee de l'Architecture, etc. (Vol. 7, p. 220 et seq.), and we reproduce in Fig. 143 [191] the gate tower of the Calender bridge of Cahors, lying opposite the city and erected on the other bank of the river, which was built in 1 1251, and indeed is seen from the outer side leading toward the city. The portion here given thus forms a kind of bridge-head, which directed its lines of defense against access by land as well as by water.

Note 191. From Viollet-le-Duc. Vol. 7. p. 237 et seq.

It is entirely covered by a strong house A, in which lies the access to the bridge, that one entered however, not in its axis but from both sides from a road B extending along the bank of the river. The approach on this road is commanded at each side by the doubled wall of the bridge head, that for the case of high water is furnished with openings. One enters the building A from both sides through pointed arched gates with portcullises, above which are arranged bays. In the building A one first turns at a right angle and thus reaches the vestibule of the bridge, that toward the city is closed by t the rectangular tower, through which one comes on the bridge proper. Over the gate leading into the tower is again placed a bay; likewise such are on the sides to prevent the enemy, who had taken the outer wall of the bridge head, from undermining the tower. A similar tower, but without the bays, is found at the middle of the bridge, a third being at the city side with behind it again a lower tower. A drawbridge appears to have never existed, by which the passage could be interrupted.

153. Gates in City Walls.

Particular attention is claimed by the gates of the city w wall of Cologne. Already at the time when yet the mere earth wall with its ditch surrounded the city, the entrances to it were defended by works of masonry, that are designated as"gate castles". Certainly of these earlier gate castles nothing more has come down to our time. At the same time that the stone w wall was set on the earth wall, the gates were also rebuilt. These indeed still exhibited remains of the old in the strucures now first destroyed; but substantially these belonged in their later parts to the 13 th, their upper parts in part fi-

first to the 14 th century.

The gates of Cologne were preferably erected after two different systems. In one a square tower formed the gatehouse, adjoined by two rather low wings. An example of such is the Friesen gate. In the second the gatehouse is accompanied by two externally projecting semicircular towers, an example of which is presented by the Gereon gate. The Friesen gate [192] must indeed in its lower parts be a remnant of the gate tower of the 12 th century, but in its upper portion essentially b belongs to the 13 th century.(See the adjacent plate). Larger windows must we not conceive at that time on the exterior, b but merely slots. Of the wooden projection over the gateway arch still existed the iron cramps by which it was fastened to the masonry.

Note 192. See Wiethose. Plates 37 - 40.

It is hard for us to draw the tower and both side wings without roofs; but since then such were nowhere placed on military structures, at least already in Cologne at the middle of the 15 th century, we shall leave it to the reader to conceive them. In general in the 12 th and 13 th centuries, there is always arrauged either one tower, through which the entrance passes, or there are two of these, between which is found the entrance hall. This is no appearance peculiar to Cologne. Thus the castle and the city wall of Carcassonne exhibit several gates, that lead in between two projecting semicircular towers set close together. Viollet-le-Duc treats [193] so fully of Carcassonne, that we can merely refer to him, in which we certainly must also partly leave it to him to answer for the dates, that he gives not only for the general plan, but also for the details of construction.

Note 193. See Viollet-le-Duc.

Note 194. We might doubt, that in fact it so far surpassed everything allied in Germany at the same time, as it must be according to his drawings. But Viollet-le-Duc in his splendid publication of the fortifications of Carcassonne in the Archives de la Commission des monuments historiques, what here the scope of our work unfortunately does not permit, has given e everywhere the existing condition, and has contrasted therewith the attempts at restoration, and he continued this attempt in his Dictionnaire, which we willingly acknowledge. But we

might assume a great part to be essentially later; the greatest portion of his very probable restorations, that he gives as works of the military architecture of the 12 th century, we might only acknowledge as such of the 13 th century. If we are also sufficiently instructed concerning the conditions of the civilization of that time, to know that Germany was then under the influence of the superior French civilization, then it seems to us also inconceivable, that it should not always have imitated, what was just then the "fashion", but first always have waited a hundred years, until the fashion had become sufficiently old, to imitate it, although it saw then progress made in the meantime.

Of these gates of Cologne, that chiefly still belonged after the 13 th century, the Gereon gate in any case is to be reckoned with the most interesting, whose plans we give in Figs. 145 to 147, as well as an attamept at restoration in plan and section. [195] Characteristic for Cologne is the assumption, that these bridges did not lead over the ditches to the gates as elsewhere, but always causeways enclosed on both sides by walls and defended against the ditch. Indeed we assume in view of the enclosure of the Severin gate this contribution only by the favor of our source; but there already early before the proper gate buildings must have stood walled outworks outside the ditch, that by earth and masonry walls were connected with the gate building itself, so that this plan is yet not entirely improbable, even if also varying somewhat from the rule. In the elevation in Fig. 145 we have placed roofs on structures, which we assume to be justified everywhere, even also in Cologne, so far as our starting points extend, but were never for durability of the roofs, though the upper platform was not vaulted underneath, as to be seen from the section in Fig. 146.

Note 195. From Wiethase. Plates 41, 42.

What indeed interests everyone, who has busied himself with the military architecture of the middle ages, is the series of bays arranged below the battlements, and that permit an i important effect at the moment, when the enemy has already a approached near and storms against the gate. However between the two towers were visible added wooden structures, which e even more than these bays secured the place directly before

the gate, but the bay itself made them partly superfluous. As for the form of theslot, then also that given by us after Wiethase is not that of the 13 th century, which was not widened externally, but had its narrowest place outside.

We add here to the Gereon gate also the plan of the Pantaleon gate (Fig. 144),[196] since there both side towers of the gate structure are flat and open in the rear. We have dotted the plan of its internal court. furthermore it requires only a glance at this to recognize, still more than at the Gereon gate -- and for just this we reproduce it -- that the building as shown here was either not completed or was mutilated later. Both the gates of Carcassonne as well as German buildings of similar plan show everywhere, that the towers behind the semicircle have a rectangular body with the depth of the gate b building. Thus may it have been intended or executed in Cologne, so that the internal court on the right side of the observer and dotted in Fig. 144 even shows the plan of the tower.

Note 196. From the same. Plates 14, 15.

We had opportunity to go yet farther into a series of details and to show, how these were connected with the mode of f fighting and of reach of the weapons, etc. But we have had to say already in the description of other objects, such as the gate structures, what was to be said there. Now a book like t this certainly seems not only for reading, but also freequently enough for consultation, and the reader, who always consults, might readily remain ignorant of what relates to the object. Therefore we must not fear repetition occasionally. Meantime we still believe we must not go too far in this, and request the reader to examine on such occasions what is said in former passages of this Chapter.

About to the same time as the Cologne gates also belong the Marschier gate at Aix-la-Chapelle (Figs. 148, 149),[197] which perhaps in certain parts is yet somewhat older than these.

Note 197. From Bock, F. -- The modern name of "Marsolier gate" indeed originated from "Misiers portal", as it was formerly called, (Porte des Missieurs or Nobles' gate); in the 12 th century the gate was called Porta Porcetensis.

The plan shows two round towers set close together, a part of each being cut off in order to form in the ground story t the passage between them, the rear half B being the proper g

gatehouse, which could be closed from the gate wings by a portcullis. The room A is built over above the ground story. Casting holes in the floor of this intermediate structure (Fig. 149) still permit a more effective defense. Permitted by this intermediate building, the tower character of the side parts was omitted in the upper parts, and the entrance body of the building was covered by a single roof. Indeed already in the 13 th century the roof was always merely provisional, that c could be removed, so that the great defensive platform could take part in the defense. The slots for shooting arranged in three rows over each other with their niches and the seats a arranged therein indicate the second half of the 13 th century, on the other hand the capricious form at last assumed by the slots already denote the 15 th. Toward the city the upper story of the middle building has wide formal windows.

Entirely similar is the Vienna gate at Hainburg-a-D in lower Austria; only in this the unity of the mass of the building no longer appears.[198] But it is still clearly recognizable, that the substructure, the plan of both towers belong to the earlier time, and to the later time the upper portion in which these are connected with the middle rooms into a unified mass. Thus it may also be the case with the gate at Aix-la-Chapelle, as indeed also the Cologne tower was arranged on the site and with the use of older remains in the 13 th century. Therefore must also be studied the entire series of buildings. Also the designs of several gates at Carcassonne[199] must be included. They agree with the plans of the gates of Cologne, Aix-la-Chapelle and Hainburg in so far, that we cannot doubt that an e earlier building was their basis, just as the German ones mentioned, but also that we cannot hold them substantially earlier than these, as Viollet-le-Duc represents them.

Note 198. See Mitt. d. K. K Cent. Comm. z Erf. u. Erh. d. Baudenkmale. Year 15, p. 86.

Note 199. Viollet-le-Duc. Vol. 7. p. 317.

An interesting gate is that of the city of Friesach, of which we give in Figs. 150 to 155 the plan, a view of the condition that we found nearly 30 years since, as well as an attempt at restoration. It is substantially the same arrangement as at the gate of Salzburg. There may also have been a structure of the same time as a basis for the present one, but which

in its essential parts must go into this in the 14 th century. (See Figs. 131, p. 191, 141, p. 206). That we have drawn the tower no higher occurred in regard to the thickness of the w walls; still we recall nothing to the contrary, if one wishes it higher. Noteworthy appears to us primarily the stone bridge, that indeed does not extend to the outwork of the tower, and as Fig. 150 shows, was only later lengthened to it, so that then a drawbridge was necessary; but still it could be of substantial use to the enemy. Manifestly the continual repairs, to which wooden bridger were exposed, men desired to avoid h here. It is evidently from the plan, that the tower itself h had its portcullis. We have assumed in the restoration, that a similar one was also on the outwork. Also the bars still e exist, that were slid into the wall and again drawn out, and that could be placed against the gate leaves to increase their resistance. (Fig. 152).

154. Bayen Gate at Cologne.

Entirely derived from the special conditions it had to serve is the plan of the Bayen gate at Cologne (Figs. 155, 156),[200] that we might attribute to the 14 th century. The southern p point of the city extends not quite to the Rhine, but left o open for passage along the bank the necessary wide strip of land between the water and the wall, so that one could also pass along the bank by the city of Cologne. Yet this passing traffic required oversight, and if necessary must also be interrupted at any time. But even so also the interest of the city required, that all those, who on land passed down the bank of the Rhine to Cologne, could enter the city just at this southernmost point. Therefore resulted the necessity for arranging an entrance gate there, but also at the same time a castle, that could entirely stop the way and command the Rhine so far, that it could make impossible the passage of hostile ships, and hinder their landing. It is self-evident, that any such castle was not merely a protection to the city, but also entirely adapted to control it, and to have at least a portion of it entirely in its power.

Note 200. From Cölner Thorburgen und Befestigungen. 1880-1882. Published by Society of Architects and Engineers for L Lower Rhine and Westphalia. 1883. Plate 3.

No doubt can remain, that this castle was already planned

at a very early time. In the 13 th century it found itself s still in the hands of the archbishop, but passed in 1262 into the hands of the citizens, and was then rebuilt, where the p principal part of the plan, the great square tower was restored, that was erected according to the system of the castle towers of the 11 th and 12 th centuries, and in extent equals the larger of those.

It has an external length and width of 39.4 ft., and at its foot on the north and south sides was also surrounded by the solidly built city wall about 4.3 ft. thick. The wall attached on the east side passed north across the shore road, completely barricading this, and united with a narrow wing building extended far into the Rhine, which bore the name of the "Ark." At the foot of this tower now lay at the south a forecourt, corresponding to the width of the city ditch and terminating it, before which lay yet a second, [201] since the ditch was d doubled. Through these forecourts then the way led into the city at A, following the arrow and the dotted line. It appears scarcely doubtful to us, that already originally the connection of the shores at B was kept open by a gate, and that also at C existed an entrance to the city; in any case the requirements of traffic may have led soon to its construction. Originally no entrance to the tower existed, except that recognizable on our view, lying high above, to which one was drawn up from the crown of the wall and led down into the lower rooms. We are of opinion, that the central lower portion of the tower with its ashlars with bosses, together with the entrance, still belonged to the 12 th century, and that the entrance tower rose square to the height of the cornice, that now divides the octagon into two stories. There indeed stood the old defensive platform with its battlements, and a spire arose with dormers. After 1262 the castle passed into the hands of the city, and it may well have been largely destroyed by it, that first was necessarily repaired until the entirely new arrangement succeeded, for which also the tower might yet appear usable. Therefore it followed with the use of the same probably in the 14 th century, and certain ornamental transformations may have resulted from repairs of the 15 th century. But besides the tower of the gate buildings no longer is so much preserved, that we have been able to speak here of more

than the plan.

Note 201. Thus we believe that the original plan can still be determined from the enlarged later structure further south, that Wiethose shows. Since the city ditches were always dry, thus never connected with the Rhine, and before the gates of Cologne were never bridges but always dykes, so we can regard the closing of the ditches on the south side as otherwise impossible, than by such an outwork enclosed by walls, through which the way led. However whether further outside a later outwork did not exist, as also before the other gates of Cologne, we shall not thereby regard as impossible.

Most to be regretted is it, that the Ark no longer remains; as appears from the old pictures, it must have been a highly interesting structure with many noteworthy peculiarities. Its chief purpose seems to have been, to give the Bayen gate building as great a front as possible toward the Rhine, from which hostile vessels could be fired on, and could be stopped. For the latter purpose also served the chain, that passed from t the ark over the Rhine stream to the right bank. Doubtless a also we must assume, that buildings in the water or at least driven piles, etc., did not leave the entire width of the stream open for navigation, but compelled the vessels to approach the left bank closely in their course, so that they could follow this way only within reach of shots from this ark.

The Bayen tower has become a mark of the city of Cologne by its characteristic external appearance. Already in the oldest view of Cologne, that we recall at the moment, in Rolevinck's Fascicules temporum of 1481, it appears without a roof. Thus we must indeed assume, that also already in the 15 th century it had none. Therefore we opposed the attempt in our illustration to place a roof also on this tower. May the fact that it had none be attributed to the circumstance, that in the 15 th century it must have suffered repairs and small rebuildings? The small angle bays with their little battlements at the beginning of the octagon do not recall mediaeval architecture a at all, and may have been so constructed in a still later time, as our drawing gives them.

155. Eschenheimer Gate at Frankfort.

An example of the ornamental development, such as it became in the 15 th century in part for the military buildings in

Germany, is the round tower of the Eschenheimer gate at Frankfort-a-M (Fig. 147), whose masonry spire stands behind a projecting series of battlements, that is interrupted by four r round turrets projecting still further. The round tower has a square substructure, around which on the inside the defensive gallery of the walls is carried on ever further projecting c corbels in circular form, corresponding to the round form of the tower. On the outer side here project two octagonal turrets.

156. Stein Gate at Basle.

An architectural plan of a peculiar sort is shown by the S Stein gate at Basle, whose plan we give in Fig. 158. [202]

Note 202. From F. Schultz in Mitt. d. K.K. Cent. Comm. z. Erf. u. Erh. d. Boudenkmole. 1868. p. 128.

Beside the mouth of a brook flowing through the city, that is protected by double walls, there is found at A an entrance gate, which corresponds at B to an outer gate located outside the enclosure, in exchange for which the entrance at C did n not exist originally. The line C D is the inner wall, E F is the outer or enclosure wall. To allow the flow of water without interrupting the fortification, a masonry pier is built on a rock in the middle of the bed for each, and from these two arches are turned to the shore walls, through which the water can flow, which is kept so high, that on reaching the city it passes over a dam, so that boats coming there must i inevitably fall with the flood and be destroyed. However since not always was a sufficient height of water to be counted on, then men added also portcullises as a precaution. Fig. 159 [203] shows the internal view of this work from the city side. We see how the pier is perforated, as a passage just above the water and corresponds to the openings for flow, is built in wooden construction, and niches with slots for shooting allow the reception with crossbow shots for those approaching on t the water. We see how a broad defensive gallery is constructed on the crown of the wall by a projecting wooden structure, a and how a turret on the pier commands the entire structure.

Such inlets for water and again the exits corresponding to them at different parts of the city wall were of great importance for the requirements of so many cities on flowing water. In Nuremberg, where the two sides of the city separated by t the Pegnitz are enclosed by a common wall, there must be con-

constructed one of the most extensive plans of this kind, that on the whole and in its details is the more interesting to s study, since inflow and outflow are very intelligently constructed, both in the inner line of walls as well as the outer one. It is unfortunate that the space allowed us requires, as for many other things, also forbids the presentation of more than one example of such a river gate.

157. Ostentatious Towers.

A group of peculiar gate buildings distinguished by rich d decorative ornament is presented by north Germany, particularly the Mark of Brandenburg, in characteristically constructed brick structures from the close of the 14 th to the close of the 15 th century. The ground for this peculiar treatment of military architecture must have been laid by the architectural activity of the emperor Charles IV, as it also forms the basis of the rich ornamental development, which characterizes the military buildings of Bohemia until in the 15 th century. The highest development certainly falls far later, and if in Bohemia to the time of Wenzel and of Sigismund the most richly t treated works belong, then in that of the Mark it is that of the Hohenzollerns, which gave the development of the cities such an impulse, that not merely strong buildings, but they could also erect ostentatious structures for their defense.

To the earlier works of this group we may assign the water gate at Tangermünde, whose outer side we give in Fig. 160.[203] The great windows we must certainly conceive as omitted; certainly only slots were where they now are. The building consists of a square tower, against which was later built on the inside also a low gatehouse of equal size. Closed at top by a platform with battlements, the exterior is thereby very characteristically subdivided, so that the pointed opening of the gate stands within a depressed pointed niche with more that twice the height of the gate.

Note 203. From Adler, F. Mitt. Bock. Bauw. d. Preus. Staat- Vol. 1. Pl. 39, p. 73. Berlin. 1862. -- Adler certainly assumes, based on some existing brick stamps, that the building f first belongs to the time of 1470, in which we cannot agree with him. If the stamps be actually so late, then repairs may have been made on the building about that time.

We find such niches in France on buildings of the 13 th and

14 th centuries, where they serve to form casting holes, through which the enemy at the foot of the wall could be pelted, and indeed they are used not merely on towers. Similar is the arrangement on the residence of the grand master at Marienburg. However as our gate has such small defth, that in the opinion of the architect it was not arranged for that purpose. Here it concerns only a special construction for the portcullis. Doubtless the latter was indeed better so arranged, that it could be drawn up inside the enclosing wall, for example as in Fig. 97 (p. 160). But this required, that either no gate leaves could exist, and only the drawbridge formed the clorure of the gate before the portcullis, or that the walls should have such thickness, that the gate leaves should lie in the jambs of the gate. But Where they extended back over the thickness when opened, the portcullis must be outside the leaves (Fig. 152). Since the wall must then be divided by a slot, extending lengthwise into two parts, an outer one lying before the portcullis, no longer having any purpose for the resistance of the building, and the inner one, between the two the portcullis was raised and dropped. This outer wall here and in other similar cases is simply omitted above the gate, so that the portcullis remained visible to the enemy, even when standing open. Later men must go still further, and simply a allowed some hook-shaped projecting stones to project above each other from the face of the wall, in the angles of which the portcullis could be raised and lowered at sight of the e enemy; thus for example on the western gate tower, the so-called "pointed tower" at Miltenberg-o-M, from the close of the 14 th century. Very characteristic already on the outer gate at Tangermunde is made the ornamental form of the battlements. On the frieze beneath the battlements are placed shields of arms, whose elongated form still recalls the beginning of the 14 th century. 204

Note 204. Those versed in heraldry will see at once, that they are set inclined. According to the rules of heraldry every shield shall be so placed, as it appears when the one fighting bears it on his arm, as it also particularly appears to the oppenent against whom it is carried. (The case is otherwise, if two shields are combined and thus inclined toward each other as in Fig. 164). But the position appearing here

appears occasionally, also thus on the frieze in Fig. 162, wh while there the two lower shields are correctly placed.

Most of these gate structures in the Mark furthermore have their entrance halls not within a tower. It is generally only a very simple hall, that has a platform at the height of the defensive gallery of the wall, at whose side is then placed a tower, which commands and defends the gate.

Such a tower as that represented in Fig. 161 [203] standing beside the Hühnerdorf gate in Tangermünde, whose lower square portion perhaps belongs to a still earlier time, but in any case at latest to the 14 th century, its acpricious upper octagonal portion however falling in the 15 th centurw. The bay originally had open floors. The battlements wit: their narrow verticals cannot possibly have been, as they are represented in the illustration. It indeed received its present form by a restoration in the 17 th or 18 th century, when men no longer had any understanding of the forms of the earlier military a architecture.

The octagonal Mühleu gate tower at Brandenburg, whose eight sides are likewise divided in blind windows like those of churches, is of 1401. Thus also may have been the battlements.

Square is the tower standing beside the Rathenower gate at Braudenburg, whose elevation and section we give in Figs. 162, 163. [205] Both lower stories are round internally; the ground story naturally originally had no entrance; the two next stories are square; above four pendentives is then placed a masonrw cone as a roof, held together by crossed wooden arches. a building date is not fixed; we might therefore regard as s such the change from the 14 th to the 15 th centuries. Instead of battlements appear at top slot-shaped windows (indeed later ?).

Note 205. Adler. Plates 15, 16.

Just so is lacking the determination of a date for the round tower at the Stern gate at Brandenburg, which we illustrate in Figs. 164 to 168. [206] It is mentioned as existing in the thirties of the 15 th century, and thus may have been erected at the close of the first quarter.

Note 206. From the same. Plate 40 and page 74.

It now has two entrances in the ground story, only one of which is original, but certainly did not lead into the inter-

interior but only to a winding stairway, that ascended in the thickness of the wall, so that the men could reach the battlements directly from the street; for one must still gradually recognize, how important it must have been for effective defense, that the defenders could also easily ascend and descend. Over the ground story are four low and partially vaulted stories, a defensive platform does not exist, but on the contrary a broad passage behend the battlements and a conical masonry spire. What gives the tower a special charm is the use of separate glazed bricks, that are inlaid in regular alternation between the red ones. The substructure, which now appears merely as a base, may formerly have extended deeply to the bottom of the ditch. Likewise the battlements are characterized by colored bricks and the alternation of stuccoed surfaces with the masonry members.

A likewise round tower stands beside the Neustadt gate at Tangermünde, whose plan is represented in Fig. 169,[207] and a allows us to recognize how formerly the connection of such g gate towers with the gatehouse was arranged. According to Adler the tower was erected in 1436 - 1440. The tower likewise shows the use of glazed bricks; 32 corbels support a gallery, that was covered by a roof and had 16 openings like windows instead of the battlements. Higher above is placed a row of iron hooks, that can have had no other purpose, that that of adding a second gallery, indeed of wood. It is given in Fig. 170 according to Adler's restoration; however we believe that a spire must have been placed on the tower, but will not contest, if anyone prefers the form, such as the Stern tower at Brandenburg still exhibits. Certainly this line will not flow from the pen of the draftsman.

Note 207. From Adler. Plate A5.

As may be seen from the plan, the gatehouse K widens inside, and to the round tower M corresponds at the other side a rectangular structure L, that however rises but little above the defensive platform of the gatehouse. The city wall N is thin, so that indeed earth piled against its base and a wooden defensive gallery gave it breadth and thickness as we have indicated in Fig. 169. The ground story of the tower M is only a accessible from the crown of the vault, which is placed at t the height of the defensive platform of the gate, from which

is the only entrance to the tower. This has aboue the ground four upper stories, corresponding to the external subdivision. Before the gate a stone bridge now leads over the city ditch. However we do not doubt at all, that originally a wooden bridge G existed, at about the middle being furnished with a movable portion H. To the external outer structure B, before which is to be conceived an enclosure A of palisades, was attached the earth wall D, partly well preserved into the 18 th century, surrounding an enclosure outside the ditch. Yet we remark that both the tower building, like the oblong building standing beside it, now have tile roofs, and indeed possessed such formerly, even if they had but a temporary character, 1 like most such structures.

Entirely allied to this design is perhaps 20 years later t the Elbe gate at Werben. Yet for the protection of the gate only at one side exists the round tower, while the other side of the gate H is without special protection; besides the latter, which at the Neustadt gate at Tangermunde projects strongly from the face of the wall, so that the exterior of the w wall can still be swept, is yet in the face of the wall itself. (See the adjacent Plate). The ground story of the round tower is also here only accessible from above. Yet it contains a w well in its interior, so that the tower is thus placed independently, entirely like a castle tower of the earlier time. The ascending stairway is accessible from the city and lies in the thickness of the wall. The tower seems to have had no masonry spire, but indeed must have had a wooden roof resting on the battlements, that covered the defensive platform. Such a roof must then also be conceived over the gate H.

Indeed the best known of this entire series of structures is the Uenglicher gate at Stendal, Figs. 171 to 174,[208] which also perhaps we must regard as the latest of that series' at least the sportive architecture indeed allows this conclusion. [209]On a square plan rises the tower structure, whose ground story contains the tower hall, that is covered by a cross vault. Above are yet two square upper stories, bordered at the angles by round turrets rising upward from the square mass of the building. This is terminated by a crown like battlements, from whose middle is then developed the round tower. The little augle turrets have masonry pinnacles with ornamental bli-

blind series of battlements. These pinnacles prove, that also the principal tower must have had such a spire, and since nothing thereon indicates that it was of masonry, then we have drawn one of wood, that rests on the row of battlements. If we further conceive a city ditch with this, from whose bottom rise tower and wall, then is the appearance naturally far more effective, than in the existing mutilated form.

Note 208. From Adler. Plote 36.

Note 209. The tower must indeed be placed in the time from 1470 to 1490, which the windows instead of slots indicate. N Noteworthy is for this time the form of the shields.

A pecuialr treatment is shown by the Ruppin gate at G#ansee (Brandenburg), whose near side toward the city is rechly ornamented, and we reproduce it in Fig. 175. [210] It is imitated from the facade of a house. Above the gate hall are two upper stories, over which is a gable divided in three parts, which corresponds to a gable roof, that is placed above this tower structure, just as on a house. [211]

Note 210. From Adler. Plote 77.

Note 211. Similor, ornamentolly treoted, but still richer in its lower portion and ovoiding oll reminiscence of militory orchitecture, oppears the rother eorlier entronce gote to the monostery of Chorin, the "portol house", which we reproduce in Fig. 176 (from Adler, plote 69). Elsewhere ond so in Moulbronn, olso the Cistercion monostery ore surrounded by fortifications and the entronce tower is o fortress tower. But these fortifications of the monostery, just like those of Moulbronn, were yet only sufficient ogoinst o sudden surprise by o smoll body, ond it oppeors thot just here men ovoided the choice of the forms of militory orchitecture.

Similar in design to the gates of Cologne, but developed in a later and more ornamental architecture, appears the Spahlen gate at Basle (Fig. 177), [212] a gatehouse treated like a tower, accompanied by two round towers. Before it lies a square court enclosed by a wall, whose crown bears a defensive gallery and whose facade has a great entrance gate, and beside it is a little doorway for persons on foot.

Note 212. From F. Schultz in Mitt. d. K.K.cent. Comm. etc. 1888. p. 128.

Likewise a square gate tower with small turrets at the ang-

angles, that Merian's birdseye perspective of Metz [213] shows as the Morelle gate, according to which illustration Viollet-le-Duc has attempted to enlarge the entire work, as it is reproduced in Fig. 178.[214] Notable there is the outwork before and beyond the ditch, through which the way passes sidewise, as at the bridge gate at Cahors. Of the great and small drawbridge, which Viollet-le-Duc has drawn at the gate tower, we can find no vestige on Merian's representation, but indeed a wall facade, which connects the outer gate with the main gate, and obstructs the approach of an enemy coming from the side.

Note 213. In Topog. Palat. Rheni, etc. Description and true representation of the most prominent cities and places in the lower Palatinate on the Rhine and adjacent lands. etc.

Note 214. From Viollet-le-Duc. Vol. 1. p. 426.

Entirely developed into a bastion and arranged for defense by artillery are the two round towers of the Jerusalem or lower gate at Büdingen (Fig. 179),[215] that bear the date of 1503. In three stories over each other in the round towers are found three embrasures in each for small guns. The city ditch is almost entirely filled, so that the towers, that formerly extended down to its bottom, now appear rather low. Also the drawbridge has naturally disappeared. The stories in the interiors of the towers had beam floors; they could only receive light guns. By large cannon, that would have been too heavy, also in any case would have been too great shocks in the still little structures. The towers have only small conical stone roofs, that are surrounded by wide galleries; yet these lack all protection, so that they could nowhere protect any men. Round s stairway towers wit conical spires of similar form, attached at the rear of the round towers, lead to the different upper stories and to the galleries.

Note 215. From Moller, G. Denkmäler der deutschen Baukunst, continued by E. Gladbach. Vol. 3. p. 13, plates 49 - 51. Darmstadt. 1851.

Chapter 13. Outworks.

158. The Problem.

We have previously stated, that men regarded the gates as formal castles, that could be defended independently of the castle or city wall. We have referred to the great towers, w where the gate only consisted of a simple light gatehouse, t that was erected for its protection, and like the principal towers of castles had no entrauce at all in the ground story. Such defensive towers must now be of still greater effect, if erected outside the gate, so that by them was commanded the land outside, and at the same time access to the gate could be entirely stopped. Independent outworks of this kind already appear to have come into use very early, and men found it imperatively necessary everywhere, that a bridge was thrown across a river, to erect a bridgehead on the opposite side, and where a bridge led over the ditch, to construct at least an enclosure of palisades on the outer side, within which a part of the garrison could stay, and could contest entrance to the bridge with the approaching enemy. Thus were erected more or less extensive works in masonry, wheu there were men enough to garrison them also, and to defend them energetically.

Wiethase [216] believes himself able to assume, that already at the time, when the fortifications of Cologne only consisted of merely earth walls, the gates not merely formed strong castles in the line of the wall, but were also furnished with e enclosing outworks, that as he represented them on the title plate, were rather castles, or more formal fortified camps. Where all positive starting points are lacking, without the easilv sketched imaginations, that he has not adopted at all in the work itself, but has rejected it there, and has banished it to the allegorical composition of the title plate, to examine it in detail, we must still admit, that the ground i idea of his composition appears so correct, that we cannot oppose it. certainly so far as such works are preserved elsewhere, they do not have that extent.

Note 216. See Wiethase.

159. Outwork of the Castle at Carcassonne.

Thus at Carcassonne (Fig. 1, p. 23) on the western side of the castle next the rives Aude is found a circular work, surrounded by a ditch, but which again had its outwork enclosed

by palisades, and protected the entrance to the castle at the foot of the rock, from which it rose. The work may have originated in the second half of the 13 th century, but still had almost entirely disappeared, when Viollet-le-Duc made his drawings. Thus only his design for the restoration is represented by Fig. 180; but we have omitted the greater part of the slots in the circular wall intended for crossbow men, since nowhere do the buildings of the 13 th centurw, not even those of the 15 th, show such abundance of slots as he gives here, besides the wooden defensive gallery could receive enough m men to send arrows on all sides.

Thes independent structure is connected with the gate of t the castle by a narrow passage, that ascends the rock. In the view it indeed appears as if Viollet-le-Duc wished to represent the entrance as if it led into the circular work. Yet from its plan it is to be seen, that behind it the bridge towers and the gate lies in the passage, so that the rear part of t the bridge is swept by shots from the outwork, that is entire-separated, the way not leading through it. The passage lies b between high walls, whose crown is stepped, and is divided i into different portions by cross walls, so that each of these must be separately taken. The upper portion extends directly to F at the foot of the upper castle wall, where it turns and leads into the interior beside the tower G, first again to a flight of steps, which is easily defended, and over which one first ascends to the platform of the court.

Note 217. From the some. Vol. 1. p. 359.

160. Bastile at Paris.

Meantime most of such outworks have just the purpose for t the entrance of the city to lead through them, in order not merely to interrupt it more easily, but also to hold it as l long as possible withen reach of the lines of defense. Such a structure particiluarly adapted for this purpose was the Bastile at Paris, that was built in the 14 th century, and w whose destruction is counted among the heroic deeds of the F French revolution, whose centennial celebration by the French occurred not long since. Fortunately representations exist a and are sufficiently intelligible, so that we can reproduce from Viollet-le-Duc [218] in Fig. 181 a birdseye perspective.

Note 218. From the some. Vol. 2. p. 173.

At A stood the old rectangular tower of S. Anton's gate, to whilh led a bridge over the city ditch, but which did not posses great strength, not far from it already being a new gate with two round towers, so that about 1369 Charles V arranged the addition of a work with six other towers to these two later gate towers, that were surrounded by a ditch and had gates on four sides, through which the way passed, interrupted by bridges and drawbridges, and beyond led through outworks, so that this little castle located inside the city wall could even be defended against the city of Paris, as well as against any external enemy.

161. Outwork of the Weyer Gate at Cologne.

Of the outworks, which in the course of the middle ages the now destroyed gates of Cologne received, indeed the most extensive and most important was that, which stood before the Weyer gate, and of which at least the plan has been preserved, which we represent in Fig. 182. [219] (At a scale of 1 : 500). The rectangular gate structure was accompanied by two round towers, at both sides adjoined by the city wall; in the interior of the city lay a court at each side. The inner city ditch had a very considerable extension, at the centre of which lay a great irregular polygonal work, that is designated as the "enclosure", and was connected with the gatehouse by a wide passage.

Note 219. From Wiethase. Plate 24.

The walls surrounding the"enclosure", like the city walls had strengthening piers and arches with a slot in each arched niche. On two sides repeated trapezoidal outworks led to the outer gates. Beneath the ends of the latter outworks passed the bottom of the city ditch, and there also ended the bottom of the second outer ditch enclosing the city wall. At one side the road led toward Frechen; at the other side before the gate lay the old Roman road to Zülpich. But both roads lay u under the reach of shots from the enclosure, its angle towers and outworks. If one came from outside, had reached the first gate and entered into the outer court of access, he found himself directly opposite a slot for shooting, as well as the e entire front of the enclosure. After entering the enclosure, since its walls were lower than the main city wall and under shots from the latter, as well as from both round towers of

the gate, and finally from the gate as he approached it, and he could only then make the attempt to assault the gate..

A glance at the directions of the slots for shooting, both in the "enclosure"itself, as well as in its two entrance courts and the connection with the gate shows, what great pains men took to meet the enemy everywhere, where he might stand, and particularly at such points he wished to storm, not merely to pelt him from the front, but also from the side and rear. If we conceive this entire enclosure further equipped with p projecting defensive galleries on the crown of the wall, then results a work of quite extraordinary strength, but which also required a considerable garrison. But we also see particularly, that this garrison had easy exit and entrance into the city through the great wide gate, that accordingly it could fight in the open field or withdraw behind the walls. It was especially necessary for this, that two entrances led from outside into the enclosure.

If we conceive a similar outer castle before each gate of the city, which was correspondingly defended by casting machines, there remained to the enemy, if he did not wish to attack these mighty works, only a short space left behind two t towers indeed, mostly none at all, at which an attack on the city wall could be undertaken, without being more endangered on both sides by missiles from these outer castles, than by the directly attacked defenders of the city walls. We must i indeed refer this enclosure at the Weyer gate even to the middle of the 15 th century, the time before artillery predominated in attack and defense, to which indeed many details of later transformations are to be attributed.

162. Outwork of the Floriani Gate at Cracow.

Already arranged for firearms, even if at first only little guns and muskets, is the work before the Floriani gate in Cracow, still well preserved in all essential parts (Fig. 183),[220] of which the ditch is filled, and thus the lower portion is concealed in the earth. We know that this work belongs to the close of the 15 th century.

Note 220. See Essenwein, A. Die mittelalterliche Kunstdenkmale der Stadt Krakau. Pl. 12. Leipzig. 1868.

It is planned in the form of two-thirds of a circle, whose other third is formed by two sides of a hexagon, from whose

angle the way leads to the main gate. The entrance to the outwork does not lie on its axis, but sidewise, so that the way over the bridge to the gate must be taken under fire from the main and enclosure walls. Yet this gate with its drawbridge must belong to a late restoration, and originally an outwork existed extending further. The existing series of enclosures in the substructure only served for sweeping the ditch; the two higher rows commanded the ground outside the city, that here was certainly not wide, since the outer city was built quite close to the city itself. The projecting upper defensive gallery was intended for a great number of muskets, that were easily in condition to repel a direct storm on the work. This upper defensive gallery projected on corbels, and we can assume, that between the corbels here originally were found also casting holes; over the entrance gate such still exist. It is notable, that both the defensive gallery is open on the interior, as well as both series of holes for small guns, the upper one being served from an open balcony. But the two straight rear sides of the outwork turn their fronts toward the round court, so that the enemy, if he had penetrated there, still always saw a defensive front before the gate.

163. Outwork of the Laufer Gate at Nuremberg.

In Nuremberg the outworks directly adjoin the gates and the city wall, and they project but little beyond the wall of the enclosure into the ditch. We have in Art. 150 (p. 203) described the system of the wall of the outwork at the Laufer gate,[221] torn down a few years since, and we add its plan in Fig. 184. The enclosure at the junction on the north side was indeed very narrow for a short distance, yet only to make it possible there to arrange a ramp behind the angle tower, on which one could descend into the city ditch.

Note 221. Here this is called the place of arms. How old is this appellation, we are not in condition to prove, yet doubt that it is very old.

The gate itself at A has a rectangular tower beside it, instead of which about the middle of the 16 th century appeared one of the four famous round towers, that are erroneously attributed to Albert Durer. We assume, that then before the inner city wall and the gate was still found a small ditch, so that the gate still required a drawbridge. The position of t

the rectangular tower was excellent for commanding the external front of the wall and the gate itself, as well as the way from the outer gate to the inner one. The outer gate did not lie opposite the internal gate, it was nearly at the opposite end of the outer wall. A wooden bridge over the city ditch led to it; a drawbridge formed the end. Yet illustrations from the last century recognize, that also the middle of the bridge c could be opened. The short front of the wall containing the outer gate is likewise flanked by two well located towers, t that not only sweep the front of the wall, but also entirely covered the end of the bridge, and particularly the drawbridge. Opposite the gate also a small semicircular tower projected from the city wall, that besides the entrance doorway had two embrasures for guns. One was directed directly toward the entrance gate, to reach every one that attacked it, the other pointed toward the rectangular gate tower above the entrance to the ramp leading to the city ditch, so that if there an e enemy, who had reached the city ditch, desired to enter, he could be received not only from the angle tower of the projecting building, from the rectangular gate tower, and the inner front of the opposite wall terminating the enclosure, but also could be greeted by a small gun from this round tower.

164. Detached Outworks.

That such an outwork as that of the Nuremberg place of arms was itself of great importance for the defense of the city is clear. But to command the ground before the city further, such works were insufficient; there even followed in the middle of the 14 th century the rebuilding of the tower A, in order to erect on its platform a battery of large cannon, that should command the country afar. We have already stated in Art. 149 Sp. 202), that such batteries worked with more safety at a l lower location; and have also mentioned that such a one was also erected about the close of the 15 th century beside the forecourt of the Spittler gate, at the now so-called Kocnert's enclosure.

However if such works fulfil there purpose and are to dominate the vicinity, they must lie farther outside. The gate of Metz (Fig. 178) therefore shows us its battery removed from the outside; yet more distant are they shown by other cities, that we find in Merian. The outlook of Cracow forms the tran-

transition to this. Instead of the masonry structure rising in several stories was required only a low building with great embrasures, that similarly stood before the gates. Thus Viollet-le-Duc shows us [222] from Merian round bastions with cannon as for distant outworks of Lubeck. Such isolated outworks then led to the method of fortification of the later time.

Note 222. Viollet-le-Duc. Vol. 1. p. 429.

Chapter 14. Battlements, Definsive Galleries, Bays and Slots.

165. Review.

The honored reader, that has attentively followed us so far, will indeed have noted, that we have not attempted to establish first the rules of the military architecture of the middle ages, and to prove each by certain examples, but that in each of our Chapters we have arranged one example after another a approximately in chronological sequence, attaching remarks to each to show how the rules result from these examples themselves, but the chied rules were; carefully to study the special problem served by each separate structure, to thoroughly utilize every advantage, to make up for every disadvantage so far as the means of the master permitted -- leading to so many s separate considerations, that the rules deduced from the series of buildings have been quite limited in value, since almost nowhere could they be directly applied, and because everywhere the special case required exceptions. Particularly also the reader must have seen, that only with the greatest care the use of each separate motive can be limited to definite times.

But the attentive reader will also have noted, that sinc n now our work is intended for the circle of architects, and indeed preferably for the younger among them, we have emphasized merely what for the architect aids in recognizing and explaining the meaning of the forms, what fo him especially the knowledge of these must disclose, that why military architecture had developed its own series of forms, which is so entirely independent from that developed in church architecture, and even from that determinative in house architecture. Since we write for architects, we believed that we should also so make our entire mode of illustration, that it is easily intelligible to architects. Therefore we have sought as much as possible to change the technical military expressions of the earlier and later times, since the architect otherwise has to make his own sufficient architectural expressions, that have both come down from old times, as well as have originated in later times. Likewise these technical expressions still suffer, like technical words in architecture, partly in that they do not have the same signification at all places and times, so that

for many objects a series of different expressions occur beside each other and follow in time, so that et is then necessary first to find one's self correct in the domain of technical expression. Therefore if we believed we could enlighten our reader a little in this direction, while we avoid technical military expressions as far as possible, then we ask that this be not understood otherwise.

For example, if we avoid the term "reduit" (retreat) and f for this speak of the last defensive work, if we have nowhere said "curtain" but simply wall, this did not occur in order t to translate it from French to German, but only to avoid a t technical term superfluous to our public. In any case this cannot be entirely carried out; still we cannot get away from "zwinger" (enclosure), "bastion" and others, and since it is then necessary in our final chapter to return yet to some things in connection, that we have but partly stated incidentally and partly passed over. But also we have not everywhere b been able to perfectly complete the description and illustration of all details without breaking the connection, so that it is necessary to enter yet farther into a number of small details, to which therefore this final Chapter of mediaeval "military architecture"will be devoted.

166. Palisades.

When already before the time that we have to treat, on the crown of the arth wall was placed a row of ppointed palisades, then these first had the purpose of opposing by another hindrance the otherwise difficult ascent of the earth wall by the enemy. But they must neither be so arranged, that the enemy could easily pull them out, nor prevent the defenders from s seeing the enemy during his ascent to the crown of the wall, nor that he could cover himself by them; just as little must they hinder, if the defenders would receive the storming enemy with spear or sword. Then we must not think, that the palisades on the ring wall of our German ancestors had a considerable height. Standing firmly and deeply in the ground, sloping somewhat toward the outside and pointed at top, they must have projected about 3.3 ft. or at most 4.3 ft. from the earth, and indeed some 1 to 1.3 ft. below the point were so firmly connected together by interwoven willow rods, that it was hard to draw up a single pile. But in this way they could be seriously

effective for the defense. Men scarcely thought of a protection during the conflict itself; for such at least would have hindered as much as it relped. But to the fight of man against man it could only come at last, and for this one had the shield in the left hand to protect himself by it so far as necessary; a brave man sought no further shelter. It was otherwise before the attack commenced, so long as perhaps one was ignorant of the approach of the enemy, and the sentinels observing the vicinity stood quietly on the wall; they required a shelter, so that one could not be struck down by an arrow shot f from ambush, before he could know whether a friend or enemy apppoached. To provide such protection, at certain places taller piler may have been driven for a short distance.

167. Earliest Walls with Battlements.

Just similarly may the earliest masonry walls have received on their crowns, on which the defensive fight must occur, merely breastworks, that as the name implies only extended to the breast of a man, so that he could fight from them with s spear and sword without hindrance. But at certain places the protecting wall must have been higher, in order to cover the sentinels on the wall before the combat began. How far such such stood regularly, and if larger they also represented also distinct slots and verticals, is unknown to us.

There are relatively few old battlements remaining to us, so that it is hard to determine the dimensions even for a somewhat later time. We must indeed assume in general, that the wider the slots and verticals, the older are the battlements. It is believed that a portion of the battlements of the Wartburg still go back to the 11 th, and at latest to the 12 th century. There the slots and verticals have equal widths of something over 3.3 ft.; just as high is the breastwork at the slot, and about as much more the verticals rise above the parapet . Parapet and verticals are not oblique at top, but horizontal; the thickness amounts to between 1.6 and 2.0 ft. Similar proportions also have the battlements of the Salzburg, that may well go back to the 11 th century, even if the tops of the verticals are also later and belong to the 14 th century. The horizontal tops of the verticals make it easily possible to construct a protecting roof on them and on wooden p posts set flush in the inner face on the crown of the wall.

So long as the art of siege aimed at ascending the walls a and there overpowering the defenders, the slots could not be wide enough, for one defender,or even two,must receive the a assailant at one of these, and must be able to move freely w with spear and sword, so that the width must not be less than 3.3 ft. Archers or spearmen concealed themselves behind the verticals, and only stepped so much aside beyond them, that they could send their shots to a distance, then to quickly conceal themselves again, before the hostile archers could hit them. But then these verticals were also sufficient with width of 3.3 ft.

But both shots as well as cast stones could only strike at some distance; when the enemy had reached the immediate vicinity, they could no longer harm him. Therefore were arranged towers in the walls, that projected beyond them, so that from the sides of the towers the enemy could be shot and struck, who found himself at the foot of the wall. The attack against walls and towers occurred not merely on strong ladders, that were raised upon the walls, but also by means of towers rolling on wheels, that if possible were higher than the towers of the fortress, were moved against them, then a part of their front wall was lowered on the wall like a drawbridge, over which the assailants in overpowering numbers rushed down on the crown of the wall or the defensive platform of the tower. These wooden towers were named "bergfried." SHill-peace). It appears that whene stone towers did not exist, similar wooden structures were built on the walls, which then bore the same name; for our writers tell us of imaginary castles, that were richly equipped with wooden towers. But that the principal w work of the castle, the massive main tower, was so called even in olden times, there fails every starting point, as Köhler and Schultz have proved. It is an entirely modern and capricious use of the expression, and in it is a proof, how careful one must be in the belief in technical expressions.

168. Bays and Defensive Galleries.

If the long wall between two towers could also be swept from them, the most certain effect must be produced on the en-enemy standing at the foot, if he could be struck directly fr from above. This presented its difficulties, if great stones were first to be raised to the height of the parapet of the

battlements, and then must be thrown over with the hands, when the throwers had to bend over the solid parapet. Such a cast could only be made with safety, if a structure projecting beyond the face of the wall existed, that had openings in the floor, through which great stones could be pushed with the feet. Such projections in part could be arranged at certain places -- bays, or they could be constructed as defensive galleries enlarged externally for the entire length of the wall. With the great importance that they had, we must assume, that their use goes back into a tolerably early time; but all positive evidence for this assumption is wanting. Holes for beams permit recognition, that frameworks were attached to the upper part of the wall, are scarcely found on the earlier buildings, and we must therefore either assume, that still these projecting defensive galleries first occurred pretty late, or and we believe this should be substituted, that they had a construction indeed requiring no holes in the masonry, which was easily placed, not on the battlements themselves, but indeed with the projectiug laid on them.

If one desired these defensive galleries to be placed on the battlements as given by Viollet-le-Duc,[223] then the latter a and particularly the parapet are perfectly useless for the defense, but the passage of the defenders is very disturbing in the middle of the wooden structure. The passage must be p placed at least at the height of the parapet. [224] But if this were built above the battlements as a protecting roof, then could they have their effect, without the battlements having lost their purpose, in which case one would rather have entirely omitted them,[226] that in any case would be better than if they were disturbing by standing in the defensive gallery. Thus especially on towers, where no sweeping of the front from the sides was possible, we believe that they were erected, e even perhaps if the long wall also remained without such defense.

Note 223. Viollet-le-Duc. Vol. 6, p. 128, 131.

Note 224. The same. p. 124.

Note 225. The same. Vol. 2. p. 246.

Note 226. The same. Vol. 6, p. 127.

Just such arrangements of wooden defensive galleries frequently remain to us, that certainly belong to a later time, but it is not entirely excluded, that already before were found

similar arrangements on the same or other buildings. We can give here as examples the Pfennig tower in Strasburg (Fig. 185) [225] and the market house at Constance (Fig. 186),[227] on whose projecting wooden structures it is found, that above t the beams are in combination with the framework of the roof. It is certainly striking, that none of the buildings has battlements, that show such arrangements on the roof. Viollet-le-duc, for example gives the tower of the castle of Laval belonging to the 12 th century,[228] that has a projecting defensive gallery at the base of the roof but no battlements, although he attributes the defensive gallery to the 13 th centurw. How did this tower look previously? Did it also have battlements, that were removed, when in the 13 th century the defensive gallery was added? Or was such already in place in the 12 th?. Open questions like so many others. The tower at Dugny near Verdun [229] with its projecting defensive gallery of the 14 th century is a church tower of the 12 th century transformed i into a fortress. But if a bay like that in Fig. 185, or a defensive gallery like Fig. 186 belonged to it, which was in fixed combination with the roof into the defensive system itself, then could the roof not be removable and temporary; it must stand definitely and for itself refuse the use of the i defensive platform above the tower.

Note 227. Viollet-le-Duc. Vol. 2, p. 248. Vol. 6, p. 140.

Note 228. The same. Vol. 6. p. 127.

Note 229. The same. Vol. 6. p. 139.

Where stone corbels are built in, on which must be constructed such wooden external defensive galleries, there it was n necessary for the construction above to be anchored, whether it was fastened to the wall by beams, that passed through it, as on the Plate next p. 203, or that otherwise was produced a connection with the framework behind the wall. Very peculiar is the arrangement on the tower of the castle at Coucy, t that belonged to the 13 th century (Fig. 61, p. 116). On that the battlements are already changed into an enclosing wall w with windows, between which are made slots for shooting. The corbels to receive the gallery have but little projection, so that these must be built sloping obliquely upward (Fig. 187). [230] But since the slots are too high for use from the defensive gallery, then must be constructed a scaffold inside on wh

on which the archer could stand. The roof construction over t the outer and this internal gallery represent the firm connection, that the outward slope of the outer gallery hindered.

Note 230. Viollet-le-Duc. Vol. 6, p. 132.

Viollet-le-Duc assumes in most of his restorations of the galleries, that for each two vertical timbers behind each other in the external enclosure formed the supports of it, and horizontal timbers inserted in the space between them composed the external wall. But in all remaining to us in an ordinary half timber construction, sheather externally with vertical boards, or it has a covering of slates as at Laval.

We now have still further to mention the striking fact, that in the rich treasure of old German words none such is found, that with certainty may denote these projecting wooden defensive galleries, while the French have the word "hourd"for them, that still sounds as it were of German origin, and to which corresponds the mediaeval Latin word"hurtitia".By what other words, that we find in the old literature, were such galleries designated? For most of these it is only difficult to fix the meaning. Should by bay (erker, aerker from from arcus = arched construction) be understood not merely a projection extended a short distance, but also one extending the entire length of a wall?

169. Earliest Bays and Defensive Galleries.

Aside from the Orient, stone bays and defensive galleries must have first appeared in southern France, and have made their way from thence. Viollet-le-Duc gives [231] as the first example of the defensive gallery, which in the 13 th century was built on one of the side buildings of the cathedral at P Puy-en-Velay, and widely projecting shows two great casting holes between each two buttresses, to which further corresponds a bay of even greater projection at each buttress. In Germany some structures as Alsatian castles must be the first e examples. However it would be hard to find an earlier date. If we have unhesitatingly drawn such at Landsberg (Fig. 70, p. 128), we must then call attention to the fact, that the r remains only give certain starting points, and the arrangement first came there indeed in the 14 th or 15 th centuries.

Still another development of the battlement construction do we have to mention. On the tower of the Steinsburg (Fig. 39,

p. 155), the parapet beneath each two verticals is substantially thinner than those. Krieg von Hochfelden indeed believes that these must be regarded as later restorations; but at the buildings of Carcassonne Viollet-le-Duc draws without scruple similar thin parapets between the battlements, since such offer even easier possibilities, even without defensive galleries, over the parapet to employ large stones, even hot water or melted pitch against the enemy at the foot of the tower. We find just on this tower stone corbels, both at the entrance and also under the battlements, which give evidence that men had the intention from the beginning to build wooden bays there. We also find such corbels on other buildings of the 12 th century, and then under no circumstances can doubt, that such wooden bays with open floors were in use in Germany in the 12 th century. Their employment is established, even if men also will doubt concerning defensive galleries, thus we firmly adhere also to our hypothesis, that they were placed above the battlements. If the galleries stood over the battlements, the form of the latter was naturally just as unimportant, as if a wall beam lay on them, that supported a cornice and roof. The slots became simple windows, before which could be placed wooden shutters, which at least in part protected the archers as well as wooden defensive galleries. We do not doubt for a moment, that such shutters for the slots(between verticals) were everywhere in use in Germany in the 12 th century, where a roof lay on the battlements. The most suitable construction in every case was this, that the shutters had an axis at their tops, which turned in two bearings in the verticals of the b battlements, so that the shutters were fixed above and could be opened outward below. Thus we find the battlements equipped also in the tower of Chastel Blanc, that we have to describe in a later Heft (with the chapels).

170. Battlements with Slots for shooting.

The more the idea recurs, that the proper decision lay in repelling a storm from the battlements, the more men counted thereon in fighting the enemy afar and generally in driving off a storm -- and this became the custom in the Orient in the crusades,-- so much the so much less weight men needed to lay on the width of the slots, so much the wider could they make the protecting verticals, and from this development the condi-

condition that the slots received half the width of the verticals, whereby the latter averaged 5.2 ft. and the former 2.6 ft. in width. wen then found it suitable to add a vertical slot in the verticals, so that the archers could shoot through this slot their arrows from bows and crossbows without leaving the protection. We terme these slots best in contrast to the simple spaces"slots for shooting". Yet on the tower of the c castle at Giblet the verticals do not have such slots, although they have widths of 6.6 ft. to 3.3 ft. for the spaces. B But under each space is formed a slot, and to use it, the defensive platform is not directly surrounded by battlements, but by a thick wall with niches in which the archers could stand at the shooting slots, and that bore on their crowns the defenders of the battlements. (Fig. 97, p. 160).

In Chastel Blanc, of which we have just spoken, we already find a shooting slot arranged under each vertical. Above a broad step the parapet there has a height of about 3.3 ft., the vertical having one of 6.6 ft. The spaces between the verticals were closed by shutters. The slot is found directly at the foot of the battlements, so that the archer could aim downward without raising his crossbow, and could hit as near as possible to the foot. With opened shutters he could shoot through the spaces of the battlements to such a distance as the force of his crossbow carried his arrow. The story lying between the defensive gallery and chapel had long vertical slots in niches, and at the same time windows and shooting slots, that doubtless like those of the chapel itself were intended for archers. Accordingly the placing of shutters between the verticals appears to have been quite general. But men also did not find it always necessary to retain the battlement form. On the walls of Tortosa men quietly placed stones over the s spaces (see Plate next page 194); there also below the battlements are a ranged long slots for archers, who could shoot u upward from the foot of the inner passage in the wall, these being somewhat beveled downward, so that one could hit as close to the foot of the wall as possible. Similar shooting slots are also arranged in niches at the foot of the wall. We see in this the most important motive of military architecture transplanted from the Orient to Europe.

In Germany, ruch shooting slots in the battlements must have

occurred very late, as well as such in the lower parts of the wall, since the necessary men were mostly lacking for using them. They are indeed found in the walls of the city of Cologne, but certainly in parts of the wall, that still date from the 12 th century, even only as later openings.

In France, Viollet-le-Duc assumes this tolerably early; thus for example, he draws them without hesitation on the buildings of Carcassonne, which he attributes to about the year 1100. We might even bring to light these slots, so far as they do not remain, but place shooting slots also for France not before the year 1200. They can only have their proper importance where crossbow men existed, and even in great number, and this must have been the case first in Europe at about the end of the crusades, since such shooting slots indeed also in the later buildings of the crusaders in the Orient first found quite extended employment, as at the Krak. The earlier military structures of the crusaders in contrast to the western nowhere show a vestige of projecting wooden construction. We could indeed assume, that such also disappeared everywhere without 1 leaving a trace, like many in the West. But we do not once f find corbels, that would indicate wooden buildings for protection of the gates, since on the contrary casting holes over the doorways in the interior also occur pretty commonly, since further the climate made unnecessary any protection of the w wall there against the effects of weather, so that we must indeed assume, that men there consistently avoided the aiding structures of wood. But projecting construction in stone is first found so late, that we must assume, that these constructions of projecting bays and defensive galleries so well established in the West were first found indispensable there in the last period of defense, and were introduced, when men avoided executing them in wood, and also chose stone.

171. Stone Bays.

In the West stone bays may also have occurred at about the same time in military architecture; for we cannot know indeed, whether just the earliest examples of such stone construction in the West has remained and been made known. At the moment we know of none to name, and might rather in the construction of the Krak find the models for different western ones. Figs. 55 to 57 on p. 109, 110 first permit recognition, how the outer

enclosure of the Krak has not merely a series of battlements, that besides the spaces also have slots under the verticals. But jelow the crown of the wall protected by the battlements is also a passage in the thickness of the wall; in many places are several such passages over each other, that also are equipped with external slots. Yet one of these passages has between the slots also an entire row of bays, through whose open floors the enemy standing at the foot of the wall could be pe pelted and poured on. However on the southern principal tower and the two southern towers of the east side is arranged on projecting corbels a complete gallery, that in the floor has openings between the corbels, but also shows no slots in the outer wall for fighting from above the enemy at the foot of the wall.

Although we can give no exact date and this cannot prove, that the galleries on the square tower of the castle begun in 1215 at Vienna must be imitated from those of the Krak, we might still hold to the connection; just so we doubt for no moment, that the row of buildings on the Gereon gate at C Cologne is still to be attributed to the 13 th century, like that at the Krak. These buildings have become entirely native in Cologne in the course of the 13 th century; at least Wiethase also found such on the other gate structures, and has b been able to add them in a fortunate way in the restoration of the castle at the Holmen gate, since unfortunately the permanent preservation of the Gereon gate has been rejected.

172. Later Battlements and Bay Turrets.

The battlements on the grand master's residence of Marienburg are richly treated ornamentally; but they are also of high interest in respect to construction by their connection with the casting holes, as well as by the tolerably large openings behind the casting holes, through which indeed men could shoot very conveniently, even if with a restricted line of fire, but which was yet entirely concealed. The important part of the defensive gallery above the corridor on the north side, we believe should be so restored, like the crusaders' buildings, as this occurs on the right side of the observer in Fig. 128 (p. 185), so that the long front of the new castle could be effectively swept thereby.

But with the 14 th century in general the battlements only

had the importance of a remembrance. Men were accustomed to see military structures equipped with them, and therefore still always employed them, thus especially on Rhenish buildings, so at the close of the 14 th century even on the city wall of Nuremberg. In the verticals of the battlements are found slots, yet in contrast to the eastern, not at the foot but above the parapet. certainly on the towers aee no longer found the battlements. On the other hand occur the ornamental bay turrets at the edge of the roof, which are also arranged on the angles of the grand master's residence at Marienburg. In magnitude as there, where they afford a platform of 16.4 ft diameter, where casting holes of no less extent are arranged between t the massive corbels, and the oblique side of these enlarges the line of fire, also particularly made possible the sweeping of the front of the bay itself, they had great importance for the defense in case of direct attack on the otherwise open h house. Just as they occur on the wall towers in Nuremberg, t their warlike importance was not especially great (Fig. 132, p. 196), even if an archer had room in the turret, or a sentinel could better observe from thence the vicinity, than from the shooting slots of the tower. In spite of their little importance these turrets ever more came into use in the course of the 14 th century as particularly usable decorations. They especially play a great part also in the Bohemian buildings of Charles IV. The French designate those turrets by the name of "echauguette", and Viollet-le-Duc calls Prague the city of t turrets. An earlier German expression for them (for the name of wathc house does not appear to us as suitable) is unknown to us. It is also in ornamental use, since in the 14 th century the importance of these turrets was little for the defense, then we may very well think, that they came into occasional use for lookouts, or if they projected and were open at th the bottom, could already become so important for the defense, that we should not wonder at an earlier occurrence. But since no use of similar stone construction is known to us from the 12 th and 13 th centuries, then we believe, that they were t then constructed of wood, and that we have to seek them under the works designated as towers, that likewise in any case were some sort of wooden tower.

But in the 14 th century we also have the fact on towers and

other buildings stand on slightly projecting corbels, that are connected by ornamental arches, leaving a narrow gallery behind them at the base of the roof. Their course is partly broken by such decorative turrets, as we have just described them; occasionally such are merely placed at the angles. This flat projection of the battlements on corbels is nothing else than the purely ornamental imitation of such galleries, that project on strongly projecting corbels. Thus we must assume, that previously the battlements where such casting holes existed projected from the face of the wall in such a manner, as we have assumed in our restoration of the court in Fig. 70 (p. 128). certainly only vestiges of this arrangement remain there; they are only preserved for us in Germany in examples, that are later than the oruamental imitation of these in relief, and we know in fact at the momeut none such to name out of G Germany, which go back beyond the close of the 14 th century.

In Italy and France older ones may occur. For Italy indeed has become typical the arrangement of massiwe and boldly rising corbels, which bear the heavy appearing series of battlemen s. It is also found there placed on far earlier buildings. We can also assume, that those of towers and hall structures in the 14 th century were no longer calculated for (visible) roofs. However this was still everywhere the case in Germany, and where we see that the battlements are so arranged, that the roof cannot be placed on the battlements, these there only enclosed an open passage at the edge of the roof rising behind them. We give in Figs. 188, 189, [232] the elevation and section of the row of battlements on the little Gunibert's tower at Cologne (at a scale of 1 : 25), since this example is characteristic for the form of these battlements for the middle and lower Rhine. The upper wall is of tufa; the corbels aud the ornamental frieze are inserted in sandstone. The proportion of width of spaces to that of the verticals is not quite 1 : 2. In the verticals are the shooting slots. [233]

Note 232. From Wiethose, plate 51.

Note 233. We also repeat at this opportunity, that in all similar designs and so in Fig. 135, we must assume, that originally roofs existed or at least were intended, even if we have only indicated such there.

It is self-evident, that the dimensions of the building are

not entirely without influence on those of the battlements; the example here given in its dimensions belongs to the smallest. Therefore we do not omit to call attention to the fact, that it is the crown of the building represented in Fig. 135, and refer to a comparison with Fig. 156, where the battlements show substantially greater dimensions. We cannot now certainly designate simply as a parapet, what we see under the battlements; for it has dimensions exceeding the height of a man. T Thus we must assume that behind this wall was found an elevated passage, that only left above it the height of the parapet to the lower end of the space. Thus also the condition for t the battlements on the Schlüsselfelder religious house at Nuremberg, of which in addition to Fig. 129 (p. 187) we give an elevation (at scale of 1 : 25) on the adjacent plate and a s section in Fig. 190. Likewise here the external appearance of the building required that the parapet should extend above the cornice more thau its natural size, thus more than about 3.3 ft; hence the thickness of the wall has been continued above it, and so the passage for defenders is elevated considerabel above the defensive platform.

Besides it may be said, that our section permits the construction of it to be recognized. The beams have gains in which heavy beams are inserted lengthwise. The joists are well coated with clay, and the upper side of the beam is likewise covered with clay. The space on the beams is filled with sand, a and on this is laid a brick floor on the beams and sand filling, set well in mortar, theu a thicker coating poured on it, tamfed and smoothed on top, which consists of pounded brick fragments and gypsum. This is so tight and hard, that it certainly could protect the building from dampness for a long t time, even if the roof were leaking. Our section also permits it to be seen how the roof is set on the defensive platform. It stands without any connection with the lower beams, but also does not rest on the battlemeuts themselves, but on posts, that staud behind the battlements and are connected by plates.

The parapet is constructed of large stone slabs; just so a are the verticals composed of slabs of stone; they do not once have entirely the width of the spaces. The slabs are so thin iu proportion to their dimensions, that the entire construction is properly stable only by the posts, which are attached

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to them and bear the roof beams and rafters. Shooting with the machines of the 15 th century, they could not possible resist. But also Schlüsselfelder indeed might not fear such at all, when he built his strong house. He only thought indeed of securing himself against a riot of his fellow citizens, as two decades earlier one had raged in the revolt of the artizans against the patrician families in Nuremberg. For this might suffice house and battlements, and even so the lightly built angle turrets, that indeed must not be heavy, if with the very considerable projection they were not to fall outward. An aiding construction for holding them fast does not exist; only the roof beams must act as anchors.

174. Richer Arrangements of Battlements.

The present example shows us in a very characteristic manner how such a serious element by origin, in its importance so e essential to military architecture, must suffer an enormous transformation, as soon as it had become meaningless. We strongly regret, that by the scope of our work we are compelled to impose restraints on ourselves in many respects. Therefore we unfortunately cannot go into the form of the battlements of the Italian Renaissance, whose partly foreign shapes are erected to pass for marks of parties of Ghibellines and of Guelphs. We cannot follow further the ornamental development of the battlements on Bohemian buildings, but still must devote some attention to the peculiar ornamentation, that developed from the material in the domain of north German brick construction. We reproduce in Figs. 191 to 193 (likewise at the scale of 1 : 25) plan, section and elevation of a portion of the battlement 234 of the stone gate tower in Brandenberg reproduced in Fig. 164 (p. 225). In contrast to the just described Nuremberg battlements, in which the parapet is horizontal and is independently decorated, on which then without reference to the lower division the decoration of the vertical is established, how one even holds its division as necessary, the subdivision is [illegible] entire ornamentation. As visible, piers are built to the height required by the verticals at equal distances; each pair of such c piers are connected at top, and with their recessed panel and and their projecting crown form a vertical. The panel is subdivided like tracery by a moulded post and two ornamental or-

arches. The simple width of such a panel, that is carried to only half the height, gave the the design for the space. The alternation of glazed and ordinary bricks with the stucco ground gives a charming play of color, the strong relief of the members a pleasing shadow, that in consideration of the plan is perhaps too bold, but in reality where it occurs against the play of color of the different materials, appears excellently well caclulated. Of very good artistic effect is the p proportion of the dimensions of the battlements to the entire building, whose height we have to regard as increased by the ditch. But if we conceive these battlements filled with men, and must be defended against an enemy ascending the tower, t then the height and thickness of the parapet would make this impossible. The entire row of battlements is nothing more than a decoration of the tower according to a motive, which the old derivation regarded as suitable for military architecture. The addition of slots for shooting was no longer held to be necessary, in order at least to make the gallery usable for placing archers.

Somewhat more appropriate appears the arrangement of battlements on the defensive platform over the gatehouse of the Neustadt gate at Tangermünde, where at least the dimensions of the human body are better suited; likewise the bay (Fig. 194),
235 there placed in the middle of the gate, and is decorated live the verticals of the battlements, having in every respect dimensions corresponding to its purpose; on the other hand we might doubt, that the open rosettes in the bay, as in the verticals and in the parapet under the spaces, are openings suitably constructed for shooting. In any case the intention to ornament has contributed more to the forms received by these openings for shooting, than suitability for fighting. More a appropriate is certainly the construction of the lower gallery on the round tower of this gate (Fig. 170, p. 227). If we assume that the rather large window openings were protected by heavy wooden shutters, then an effective fire could be maintained from thence on all sides, and if the enemy had come near enough, a severe reception for him was prepared by the openings in the floor of the gallery between the corbels. If then the added wooden gallery even supported this effect in some degree, then must the tower be a strong bulwark against the enemy, even if the uppermost gallery and the battlements were

a mere decoration.

Note 235. From Adler. Plote 34.

175. Later Slots for Shooting.

In conclusion let some attention be given yet to the slots, as they were constructed in this later time. We have seen the first of these appear in the crusaders' buildings, and have already said of them that they were always narrow in the outer face of the wall, but were made wider inside. This arrangement was also still the prevailing one in the beginning of the 15 th century. Fig. 195 [236] exhibits the construction of one of the slots of the Vühlen gate tower at Brandenburg. The plan indicates that one with a crossbow, whose bow had a chord of about 1.6 ft. could not pass far into the interior of the slot, that he must accordingly hold the crossbow before the opening, and thus was then limited to a rather small angle, while the slot with a width of 5 ins. was still wide enough to be visible afar, thereby serving the enemy as a mark. From the beginning onward in the construction of the bow and crossbow, for the slot to have the greatest possible extent vertically, so that the archers, inserting the weapon in them as far as the width of the slot allowed, should have the utmost possible freedom of movement, when he swung the weapon in the arch downward vertically before his face. Since he generally had to shoot downward, then particularly a sloping bottom was necessary for a great thickness of the wall, also partly to obtain a greater angle of fire, also with a greater width of the lower end, as we have already seen on the plate next page 194, and Viollet-le-Duc shows in its greatest extent on certain b buildings at Carcassonne.

Note 236. From Adler. Plote 17.

With the introduction of firearms the conditions did not change at first. Both for muskets as for arquebuses (which w were nothing more than a larger example of the musket, that became too heavy to be held free, and had a hook beneath for fixing) was required a long slot, in order to insert them vertically from above like the crossbow. The smoke produced by f firing was obstructive inside, and thus under all circumstances the muzzle must project from the slot. But then if the s slot were already sufficiently visible externally by its size, to serve as a mark, then the smoke gave still more opportunity

for this, and with further reaching balls one could more easily hit the men inside through the slot, than with crossbow bolts. Figs. 196 and 197 exhibit an attempt for protecting t themselves. The slots are there made tolerably wide; but in them is inserted a wooden cylinder fitting quite close, that can be rotated about its axis, and again has a slot sufficiently wide for passing through the musket. This cylinder was so placed, that the slot was not turned outside, so that every ball struck the wood and remained in it; only when the man had stuck his musket through the slot did he turn it so far, that he could quickly aim and fire, then turning the cylinder again at once before he withdrew his weapon, he found complete protection. There came into use two kinds of such cylinders, one of which had a slot widened below, Figs. 198, 199, for better understanding given at a larger scale, the plans of both cylinder constructions, by which it is evident, that the lines of fire could make a considerable angle.

An entirely similar construction is found on castle Harburg in Bavarian Swabia; [237] only there instead of the cylinders are arranged wooden balls, that are bored and can be turned in all directions, so that the slot externally has only a small round hole, and when one sticks the musket through the hole in the ball, he could fire in any direction, right and left, up or down. It is self-evident that the hole was just large enough to aim over the barrel, just as in the previously mentioned case of the slot. Yet the outlook was so restricted, that still the advantages of the construction were not enough to ensure permanently the introduction of these wooden inserts in the slots, and therefore we see them limited to a few cases.

Note 237. Railway Station between Nördlingen and Donauwörth.

As the last step in the development of the slots for shooting belonging to the middle ages, we yet have to designate the ornamental form of oblique position instead of vertical, by L-shaped arrangement, by the connection of horizontal transverse slots with the vertical, and by the use of circular and crescent-shaped openings.

176. Embrasures for Cannon.

Where men had passed to the use of guns of even small calibre, in order to make loading easier, the mouth of the gun m

must be withdrawn too far. Then with the danger that the embrasure would be still more visible externally, these were made wider outside, the narrowest place being at the inner side. Yet since it was necessary to aim right or left in one plane with quite small variation in elevation, these embrasures are mostly wide and low, as to be seen in Fig. 179 (p. 231). Only exceptionally is it necessary to also aim up or down at the same time, so that the embrasures must also be made higher. (p. 183).

Thus we may conclude the brief sketch of the development of military architecture in the middle ages. The likewise very instructive study for which the 16 th and 17 th centuries afford opportunity, may be reserved for another time or another pen. For us citizen architects however this has less interest, since we are less readily in position to need to restore military buildings of those times; for if these are still so important and interesting, they mostly still lack the chance of the romantic, that in the eyes of layman extends to the military structures of the middle ages, so that we shall scarcely receive the order to reproduce a "bastion" of the 16 th or 1 17 th century, but indeed only that of restoring a castle of the 12 th century, or to build a summer residence, that is so nearly like a castle. Since many faults will not then be made, if our contemporaries a e willing to instruct themselves somewhat on the meaning and development of the forms. May our study stimulate them, and afford opportunity for more thorough researches and drawings, for which still waits many an interesting structure.

THE END.

HANDBOOK OF ARCHITECTURE

Part II

ARCHITECTURAL STYLES

Volume 4

ROMANESQUE AND GOTHIC

Heft 2

HOUSE ARCHITECTURE

By Professor Otto Stiehl

Second Edition

Leipzig

1908

Translated by N. Clifford Ricker. D. Arch.

Professor of Architecture

UNIVERSITY OF ARCHITECTURE

Urbana. Ill.

1913

VII

Preface to the Second Edition.

The treatment of the Mediaeval house by A. von Essenwein as given in the first edition of this Heft formed an extraordinary advance for its time, and it was a very important achievement in the history of art. It presented for the first time a connected description and a comprehensive point of view for an extended domain, whose treatment had previously been restricted to widely scattered separate essays, and in the best ca case to the difficulties of the study caused by the unfavorable putting together of such word collections, too much like a dictionary. Its initiative force was therefore extremely great. But the study of secular architectural works has since set in with increased force, nourished by the increasing understanding of the high value of what these national branches of art have left behind for us in their works. By extended individual activity, the mass of observed materials has been extraordinarily increased; new combinations of ideas have appeared, and n new basal views of a partly historical and partly artistic kind make themselves felt as deeply penetrating.

Thus in the preparation of this new edition it was no longer possible to adapt the work of Essenwein by a thorough revision; there must rather appear in its place an entirely new treatment. The high appreciation due the first author is thereby afforded opportunity, that at least certain suitable portions should, unchanged if possible, be arranged in the description, and first of all, the fresh description of the Nuremberg merchant's house (p. 161-163) and the Chapter on house chapels, complete in itself.

In a work, that takes as its aim the compression of a widely branched realm of knowledge into narrow space, it is unavoidable, that the typical and commonly occurring must be emphasized first of all, in order to clearly set forth the great course of development. By this necessity it must then be taken, that what is thus given as a rule does not coincide with every separate case of such variable phenomena, since a domain treated by itself chiefly represents the development of the mediaeval city life. For well-weighed reasons, I have adhered to the previously expressed views in my book on "Das Deutsche Rathaus

VIII des Mittelalters" (Berlin, 1905), that the city carrying on b both agriculture and commerce is the determining form of settlement for the shaping of the citizen's dwelling. Opposed to the objections made to this are briefly added notes made to the sections concerned, that also the history of the cities f founded as purely "market settlements" appear to me to enforce the law, that in the middle ages the permanent welfare of a community could only be ensured by the useful possession of ground and soil. For these settlements have later universally acquired possession of farming land, that perhaps was originally lacking; thus many of them have in this manner become purely agricultural cities. Since moreover the existence of these numerically much inferior cities permit the recognition of no peculiarities, then we cannot attribute to the earliest form of their condition any great importance for our description.

Let it be added finally, that this work was composed in its general part in December, 1906. Some valuable novelties of the last year have been utilized as far as possible during the printing.

Berlin-Steglitz. February. 1908.

O. Stiehl.

HANDBOOK OF ARCHITECTURE.

1 ROMANESQUE AND GOTHIC ARCHITECTURE.

B. HOUSE ARCHITECTURE.

By Otto Stiehl.

Introduction.

a. General.

1. Predominance of Germanic Influences.

The house architecture of western Europe during the middle ages, like the entire civilization of that time, is based on a concurrence of very different influences. First of all is it determined by the naturally very slight basis, that the freshly natural peoples of Germany brought with them from their forest homes, fused with the results of the highly refined and even overripe antique civilization, that was itself likewise composed of quite polyform parts. The rich and in its way perfected development of the antique dwelling appears at the first glance to surpass infinitely the conditions of Germanic existence. But in relation to the entirely different views, that the new masters of the world brought with them, these played only a more subordinate part. Naturally the mixture of the different influences mentioned above did not occur in the same manner everywhere. Whether in the great changes of the migrations of peoples, remains of the ancient populati-on were preserved in important locations, or whether under the new role their art was more fully lost, then is the final result of their architectural fusion very different. But one can fully determine, that in the countries leading in politics as in architecture -- these are primarily the countries north of the Alps as well as upper Italy -- the influence of Germanic life far predominates in the treatment of house architecture.

Infinitely much, that city civilization had apparently acquired forever, was destroyed by fire and sword during the continuous periods of war; the loosening of all connections of the states produced such insecurity for life and property, that a also the conditions for the restoration of the destroyed structures did not exist. If one takes into consideration, that al-

already in the time of the failing Roman government, the unbe - arable pressure of taxes, misery and disturbances had oppressed the lands of earlier civilization, then it is not surprising, that also the basis of permanent tradition, the practice of t the national art of living, were completely lost in the disturbances of the national migrations, and that only miserable remains were retained in the new period. It was substantially in manual capabilities, particularly the art of building stone houses and of constructing vaults, in which southern civilization remained to the northern peoples; and even for these, men often had infrequent use, since men generally held fast to wo wooden construction, which was from ancient times customary
2 there. On the development of existence antique tradition lost its influence for centuries, in a much higher degree than for church architecture. Only in later times the remains of antique architectural styles existing in the South, at least in relation to technical skill, again powerfully influenced the mode of living of the northern peoples, after the general arrangement of the dwellings among them had already fully developed into fixed principles.

How strong this dominance of the Germanic spirit was, we may perhaps most clearly estimate by this, that even an arrangement so completely based on an oriental basis as the monastic life, soon after its penetration into southern and western Europe was imbued with Germanic ideas of community life, and its entire nature was transformed. And again on the other hand, that led to this, that by monastic influence in the countries apparently far removed from Germanic existence, the architectural customs derived from archaic German national custims were interwoven with the trains of thought transmitted from t the antique. It is therefore necessary for understanding the latest development, before we enter into the description of the mediaeval dwelling in a narrower sense, to obtain a clear idea of the original forms and grounds, which the Germans brought with them at their entrance into the world history. They are entirely of a very plain kind and lead us back to the basal conditions, under which men generally proceed to house architecture. Just by their simplicity and capability of development has their influence remained in force until in the latest

time of the middle ages, and they have thus retained such great importance for mediaeval architecture.

b. Primary Requirements.

2. Origin of the Need of Dwellings.

It can scarcely be doubtful, that the earliest need of a dwelling for mankind everywhere sprang from the endeavor to protect itself from hostile forces. While the earth still offered apparently infinite space, over which scarce mankind could distribute itself, could win life and subsistence, without being disturbed, and we must understand by these hostile forces indeed more the injuries by weather, heat, cold and wet, as well as the dangers threatened by wild beasts, than by men with hostile intentions. For under these conditions, as we find them at the earliest beginnings of all civilization, there is yet lacking the opportunity of endeavors, and also the comprehensive subdivision of classes with different aims, which form the primary requirements of human enmities. Only after a struggle had commenced for the space on earth then became too small, and for which civilization had created a certain value, that attracted the cupidity of the adjacent neighbors, and for the dangers of surprise and robbery promised a remuneration, could the necessity occur for taking into permanent consideration the defense against attacks by men. But even then the necessary ability of self defense was not always sought in the plans of dwellings, but powerful faces then also long placed their trust in the living walls, which were formed of the bodies of brave warriors about house and hearth. It was indeed not so much the fear of human enemies, that drove the primitive men of the archaic period into the natural caves of remote mountainous regions; but the circumstance, that protection against cold and the animal world would be most conveniently found there. The custom of such a life in dark caves indeed long influenced the art of planning dwellings in regard to lighting, as we shall see; evolution of richer modes of life could only appear after the primitive customs of living had yielded to o other and more artificial habits.

3. Tent of the Nomads.

Thus stands at the beginning of every development of the dwel-

dwelling not the fortified citadel or the secure cave, but the portable tent of the nomads and the hut of the peaceful settler. From the nomadic period scarcely any assured starting points indeed have been preserved for us, for the domain of the northern mediaeval art. The frequently repeated attempt to find such in the forms of many prehistoric burial urns approximates this, since these doubtless represent imitations of dwellings. But in details it does not lead to an assured result, since the forms of these primitive art products become so indefinite by the conditions of the archaic art of the potter and the awkwardness of the workman, that very diverse conclusions may be deduced from them. Whether we have to behold in some of these primitive evidences from the archaic period actual imitations of tents of nomads, therefore appears quite uncertain; it is for our purpose also without great importance, as the nomadic tent has not left behind any recognizable influence upon the later mode of living. This may be connected therewith, as von Essenwein already stated, that the word 'dwell" originally merely signified "to sleep, eat, drink and labor"somewhat in a definite place; but together with the wofds custom and usually, it originally meant the permanent, both in the sojourn as in life, the ordinary life, the customs of life and their performance.

4. Prehistoric Hut.

The starting point for the "dwelling"in this sense is formed by the fixed settlement in the simplest form of housing in huts. We can deduce something for these from the urns for ashes with tolerable certainty. Contrary to the generally received opinion, that the circular form was the primitive form of the hut, many certainly assign the rectangular form to the earliest period. We further perceive, that a hole was formed for the escape of the smoke, at least frequently at the apex of the four-sided hip roof, and that further a door closure was already known, which consisted of beams placed crosswise.

Of the plans of such huts and their equipment, not only pictures have been discovered by recent excavations, but frequently actual remains, that give us a surprising impression of how the dwelling of the well to do possessor was furnished with r

relatively great comfort even at the close of the stone period. The most important finds of this kind are those at Grossgartach near Heilbronn. [1] There was found a large settlement of about 90 dwelling places of the stone period, all of the same ground plan, only differing in dimensions and details. They are all sunk into the earth from about 1.64 to 4.10 ft., and after thousands of years their remains are recognizable by us, since the later filling of this excavation is sharply limited from the undisturbed and natural earth. The most important of these farmsteads is shown by the ground plan and section in Fig. 1.

Note 1. Schliz, A. Das steinzeitliche Dorf Grossgartach. Stuttgart. 1901.

4 It consists of two parts, a larger and entirely plain stable and a dwelling. Both buildings are conveniently accessible by descending ramps; at the house of nearly square plan this access is separated from the principal room by a division wall to form an entrance lobby or wind shield. From this entrance one passes first into the living room proper, in the middle of which is found the hearth pit. The separated sleeping room adjoined on the sheltered part of the hut, and was raised about 1.31 ft., so that its floor might also serve as a seat for the hearth room. Other seat benchesl cut from the natural soil, lie at both ends of the sleeping room. Like the floor of this room serving for beds, they were originally covered with wood; otherwise their form would not have been preservid; yet this covering has completely fallen into dust and disappeared without a trace. The sections A B and C D of our illustration show the heights of these parts and the plan of the hearth pit. In the pieces of hard clay mortar are found impressions of wooden timbers, from which one may conclude, that the walls consisted of a double interweaving of vertical sticks 1.97 to 2.36 ins. diameter with cross sticks of 1.18 in. thick, whose interspaces were filled with clay mixed with chopped straw. On both s sides a coating of pure clay mortar covered the walls; remains found prove, that they were neatly smoothed inside and were decorated on the yellow ground by painted zigzag patterns of white and red colored stripes about 3/8 inch wide.

Thus the whole forms a house design well calucalted for a

comfortable life, that gives evidence of a relatively high civilization. This impression is strengthened by the finding of carefully wrought and richly ornamented pottery, the numerous remaining and very diverse tools and weapons of stone and bone, as well as the evidence of numerous domestic animals, consisting of cattle, swine, sheep and goats. Thus will one agree with the discoverer of these archaic dwellings, when he says:--"If we compare the state of civilization in the stone period, the well equipped dwellings, arranged according to a thoughtful plan, the developed tastes and the knowledge of art, that appear from the remains of this house equipment with the remains from later times, then we cannot say, that the state of the entire civilization of the peasants of Grossgartach, if we disregard the limits imposed by the materials, was no lower in the stone period than in the later times and perhaps even today.

5. House Excavations of the later Time.

The dwellings of the stone period at Grossgartach were not destroyed by violence but willingly, indeed were abandoned by the moving of the occupants. A long interval and a complete interruption of the connection of civilization opens between them and the later settlement of the same region. So much more important is the fact, that also the later settlements, from the bronze period down to the time of Roman rule, exhibit the same ground form of the dwelling, i.e., that built over a house excavation. That is not surprising; for the form of this hut half sunk in the earth is so advantageous as a protection against the weather, that they are everywhere easily found 5 again. For the temporary shelter huts of simple forest laborers the same are in use today in Germany, though in an undeveloped state. Moltke states in his letters from Turkey, that the same mode of living was generally common in Wallachia in the first half of the 19 th century, and on the Volga the lower class still frequently live permanently today in entirely similar cave-like dwellings, sunk about 3.3 ft. deep in the earth.

6. Statements of Tacitus.

These very primitive dwellings are important in that they

bring to us an understanding of the oldest illustrations, that we possess relating to the mode of life of the ancient Germans, particularly the statements of Tacitus in "Germania". He states indeed not from his own observation, but from hearsay, and thus we obtain from him only an indefinite picture of the form and the internal arrangement of the German houses. Yet he states the custom of living in "subterranean caves", by which we understand properly something similar to the houses at Grossgartach. He further mentions, that the houses of the Germans were built without a knowledge of bricks and clay and of shapeless materials, thus indeed of clay, and that they were frequently coated with bright earthy colors. These are also things already found in the houses at Grossgartach 2000 years earlier.

7. Inferences from the Germanic national Laws; the House with a single Room.

We may form somewhat more definite opinions of the condition in which the German mode of living found itself soon after the migrations of the nations. We are there instructed by various sources, particularly by the national manuscripts of the national laws dating back to about the 6 th century, as they lie before us in the Salic law of the Franks, the laws of the Germans, of the Bavarians etc. They naturally give us no description of house and court, yet they leave to us from the sort of judicial decisions tolerably clear conclusions relating to their plans. Thus results as a common peculiarity of the German house of that time, that its interior formed a single undivided room, which extended to the roof without a horizontal ceiling. (For example, it was then connected with the ability of a new born child to inherit, that the infant should have opened its eyes and have seen the four corner posts of the house and the blackened roof.!). The floor was without covering; t the house stood without foundation and directly on the ground. Among the Franks it was so lightly constructed, that it could be overturned, which we learn because a fixed punishment existed for this case. Among the Bavarians are mentioned sunken corner and intermediate posts. One may doubt, whether this refers to a form of wattled wall with clay coating, similar to what we learned from the prehistoric buildings mentioned, or

to a kind of regular half-timber work later common and filled with clay, or where the intervals between the posts were filled with horizontal logs, like the so-called log walls. As a peculiarity appears further in the laws of the Bavarians a portico. But this was not restricted to this single race; for i its name appears similarly in all languages. On the other hand it formed a characteristic of a richer house design. Doorways existed everywhere, sometimes with and sometimes without closures. In the interior the open hearth fire burned in the middle of the room, indeed at first without raising the hearth place above the floor; above it in the roof was an opening for the escape of the smoke.

6 It results from all these facts, that the mode of living of the germans was still of archaic simplicity at their entrance into the history of the world. This picture is not much changed by certain contemporary examples of a richer kind. Thus for exalted conditions are proved larger hall structures, "halls", whose roof was supported by one or more "ridge columns", and in which we may assume careful execution of the woodwork, rich ornamentation by carving and painting in colors. Such h halls with elevated seats for the chieftain, long benches for retainers and the blazing hearth fire in the midst are frequently mentioned in the heroic songs, especially in northern Scandinavian traditions; they also frequently appear to have been finished with openings at the sides, the "eye doorways or wind-eyes." (Window is still today the English name for these!). Yet such openings are not to be understood as properly windows, but as small openings, which found their place close under the eaves, and rather served for the escape of the smoke of the hearth than for lighting.

8. Greater Farmsteads.

If a single room did not suffice for the needs of the family, as natural for important persons, then men found the simplest way was to build several similar houses. Then as an enclosure of the farmstead stood the living room, the hall, sleeping rooms, storehouses etc. As further parts of greater farmsteads occur bathhouses ("stuba", perhaps so-called from the scattering of the water) and also under various names the subterranean

dwellings previously mentioned by Tacitus, the latter designated as for occupation by the women, for weaving rooms and for storerooms. Remains of their lower parts, consisting of a circular or elliptical excavation ending in funnel shape have been frequently discovered. They were covered by a layer of beams even beneath the surface of the earth, over which rose the apartment half buried in the earth, like the prehistoric dwellings of Grossgartach described in Art. 4. Thus the lower room served as a storeroom and hiding place; the upper formed a protected dwelling place. Whether the chief use for the handiwork of the women, and especially for weaving, required under contemporary conditions, that a more abundant lighting should be introduced, may well be doubted. Against such arrangement of windows may be said, that from lack of a window closure men would have again lost the desired comfort of the room, at least for the colder part of the year; also for the simple work of prehistoric weaving, it is unnecessary to assume such great n need for bright lighting, as we now hold as self-evident. And just for comfortable warmth men placed special weight on this room. It was served both by this sinking into the earth, as well as the banking in manure already mentioned by Tacitus; f from this then comes the whole of the name of "dunc", and this was still esteemed for weaving rooms in many regions of upper Germany until in the modern period. Another designation of the plan is "pensile", perhaps derived from the extension (Latin pendere) of the floor above the lower storeroom.

From this last appellation we may then conclude, that the at first archaic room only serving for household purposes, even experienced a further development and preference on account of its comfort; for its idea was transferred as "phisel" or "pesel" to the most dignified and richest room of the house, the reception hall of later times.

The multitude of these entirely single-room structures was then increased, since it frequently appeared unseemly to a free man to dwell under a roof with servants, and because the care of animals and other requirements of rural agriculture. Even if we assume, that the greater portion of the herds lived in the open air without special protection, yet for the beasts

serving for household use some stables on the court were always necessary. Thus even under simpler conditions there existed stables, huts for the servants and maids, bakeries, store sheds and the like, and there were also found for important persons the "hall", houses for retainers and guests, besides the dwelling of the master, and we shall see that such an assemblage of mostly small structures still formed for a long time the ground form of the German farmstead.

9. Modern Peasant's House a Type of later Origin.

The present types of German rural dwellings known under the names of the "Saxon" and the "Frankish" houses, were not developed in that early period; their evolution belongs to a later time. Men long believed the contrary for the Saxon peasant's house, and could assume its derivation from the ancient Celtic buildings, that were built in three aisles with two rows of m middle supports, for the housing of an entire group of kinsmen. But this is decisively contradicted by the evidence of the sources mentioned, which afford for the Saxons no illustration essentially different from those for the other German races; a further contradiction is the circumstance, that the Anglo-S Saxons did not transport this form of house to England, which they probably would have done, if it had expressed their national customs. Moreover the uses of the different parts of the house in the Celtic family house and the Saxon peasant's dwelling are quite different, so that for comparison only remains the conformable ground plan of the three-aisled principal room. But this results entirely of itself from the purpose to construch wide rooms; it is also, without assuming any connection, employed in both the old Roman peasants' houses, according to Vitruvius' description, and in the halls of Scandinavian royal courts.

10. Equipment of the German House.

If we thus obtain for the form of ground plan of the primitive Germanic housing a very simple idea, yet one need not therefore represent the entire equipment and housekeeping as thoroughly rude and barbaric. We can much rather assume a tolerably full artistic development of the naturally prevailing wooden construction. The poor man must indeed build his house

without the aid of skilled workmen; as expressly stated, he w was owner and workman in the same person, and we must apply no high standard to his work. But for the important man, who could combine crafts of many kinds for his building, he desired to treat his buildings in an imposing manner by rich carved work on the preferred parts of the building, such as door jambs, ridge columns etc., with animated painting and perhaps also g gilding of these ornaments, and further in the use of leather work, colored embroidered fabrics for hangings on walls and for covering floors. The form world of these ornamental portions must have moved in the path of fanciful linear ornaments and interlaced borders, that especially prevailed in northern art until the 13 th century and even later. With this is recognized the decoration of the apex of the gable by stag horns or by carvings on the crossed ends of the rafters already in the earliest period. Of the effect of such ornamentation information is afforded by the spirited descriptions of the po-
8 ets, and perhaps even more important is the testimony of that Priscus, who traveled as a Greek ambassador to Attila's court and has left behind a perspicuous description of the careful and visible impression made upon him by the execution of this design, that certainly was erected by German workmen. We learn from him, that the houses of eminent men were not built of rough logs, but of carefully wrought beams, covered by beautifully smoothed and carved boards. Graceful fences in circular form, built more for ornament than safety, surrounded the entire court. In the interior of Attila's reception hall the seats of the guests were arranged entirely after the German custom along the longer side, while the king's throne was at the middle of the end. Behind this was the sleeping room of the king, only separated by tapestries and portieres of varied colors! Even here at the royal court the state hall and sleeping apartment were also combined in a single room; how much the more must we assume such a simple mode of life among those of less importance.

11. Examples from Norway.

Remains of such an original mode of living no longer remain from the period described; but we can represent to ourselves

by old houses, which in Norway's remote valleys have preserved the customs of a long vanished age until relatively recent days. There in the southern portion of the country have been found still simple rectangular wooden houses, called "bur", with a fireplace at the middle and an open vestibule (Fig. 2 [2]), entirely corresponding to the descriptions of those old law books. There also in Thelemarken has been preserved the custom of increasing the number of buildings, when a single one of the usual dimensions no longer sufficed. Fig. 3 [3] exhibits the development of such a group.of houses, that is entirely based on the expedients of simple wooden construction, and therefore may be regarded as a continuation of primitive types. These further show, how such houses were elevated above ground on v vertical posts, in order to protect them and their contents better from dampness, perhaps also against animals; finally, how the design of an upper story ("sollers") was added under the simplest conditions. But there are also found in Norway examples of the earliest extension of these ground forms.Thus it apparently became the usual custom there to enclose the vestibule, and for protection against the hard winter to provide it with a side entrance to stop the wind, whereby a separation of the projecting reat part of the room resulted in the form of a chamber. Figs. 4 to 6 [3] represent such a house from
9 Kveste near Saetersdal, dating from the year 1668, and Fig. 5 is the ground plan at the scale chosen for all illustrations in this Heft, Fig. 6 being the same ground plan repeated at t twice the scale for better observation.

2.Henning, R. Das deutsche Haus. p. 64, Fig. 36, and p. 68, Fig. 40. Strasburg. 1882.

Note 3. Dietrichson, L. & H. Munthe. Die Holzbaukunst Norwegens in Vergangenheit und Gegenwart. Pl. F. Berlin. 1893.

We see in the middle of the room the isolated hearth, over which the kettle hangs on a rotating crane. An opening in the roof permits the escape of the smoke and at the same time, as the only source of light, admits to the room a certain amount of light, sufficient for the simple requirements. It was common to close this by a frame covered with transparent materials for better protection from the weather. Along the three

walls of the room not occupied by doorways extended benches; opposite the entrance a table occupies the entire width of the room, also with movable bench seats, so that numerous occupants could find places at the same time. On the upper part of the wall were fixed board shelves to receive the smaller utensils; almost one-half the floor area was then occupied by a scaffold placed at the height of the beginning of the roof, that forms the germ of an upper story and could be utilized, both as a storeroom and a sleeping place. A similar suspended floor is also arranged above the entrance lobby.

Aside from the two elevated sleeping places, which are indicated on the plan by dotted lines, this house takes us back to the most ancient arrangement of permanent dwellings, and it c contains nothing in arrangement or construction, that we cannot assume to have existed as well in the primitive German dwelling. of a well to do man. A peculiarity compelled by the Norwegian climate indeed consists of the narrow and plain portico covered by a shed roof, that extends along the two weather sides of the house externally. It serves well as a handy storage place for forewood, that in such a manner may contribute by its use to the warmth of the house.

12. Influence of Antique Building Customs.

It is now next to believe, that this plain form of German architecture must have been thoroughly and completely transformed by close contact with the more developed antique customs, such as the conquest of the western Roman lands introduced. And yet this is not wholly the case, and this also explains without difficulty, that the cities in which the antique civilization endured through the devastations of the migrations of the nations, possessed small attractions for the German conquerors. That the antique custom of dwelling in small, dark and cave-like rooms, that Germans accustomed to free space could not en-
10 dure, is to be directly assumed. They also further preferred their native manner of living in detached huts. Thus the general arrangement of the court, usually composed of a number of single room houses, came to predominate not only in German lands, but also in the conquered Roman domain, even in the South of France, permeated by antique civilization. First of all, the

great hall as the chief part of important dwellings was also introduced in southern architecture.[4] We also meet with it in the famous edict, decreed by the Lombard King Lothari about t the middle of the 7 th century concerning the working conditions of the mechanics of upper Italy, the Comacine masters, appearing under the name of "sala" as a permanent and generally understood conception.

Note 4. Enlart, C. Manuel d'Archaeologie francaise. Vol. 2. p. 59. Paris. n.d.

But still in details much was introduced into the building customs of the new masters. Naturally for the erection of their buildings they employed artisans of the subjugated regions, and by these stone construction was frequently substituted in place of the ordinary wooden construction, first in the South and then gradually in the Northwest. Thus the Germans adopted the names of most technical expressions occurring in it. The words were formed after the Roman manner, but frequently with a characteristic change of gender, like wall, (mauer, feminine, murus, masculine); feminine like the wall, the pier (pfeiler, from pilarium, neuter, and shrodil, wooden support); further brick (ziegel, tegula, feminine; the stone), mortar (mörtel, from mortuarium, neuter, lime), limewash (estrich, astricum, neuter; the canal). Other still simple borrowings such as lime (kalk, calx), pavement (pflaster, emplastrum) and the chamber (kammer, kamera [5]). According to the original meaning of the word, the latter was at first the designation of a vaulted room, then more generally that of an important apartment. Through southern influence men further became accustomed to c construct the important main building in two stories. Above the lower customary hall the "solar" (soller; solarium) was built as a dining or sleeping room.

Note 5. Heyne, M. Das deutsche Wohnungswesen. Leipzig. 1899.

How difficult became the adoption of this new arrangement is easily apparent. Already the simple and durable construction of such buildings presented great difficulties, where well trained mechanics were not at command, and where they had fortunately been erected, care and security were wanting to their maintenance. We possess numerous tales of the falling and oth-

other injuries to such structures. Thus in the year 586 Duke Beppolenus of Angers and his retainers broke through the floor of his dining room (solar); in the year 876 a dining hall fell under Charles the German; even in the year 1045 the same misfortune occurred under the Emperor Henry III. Such a building in stories also require the construction of stairways and ceilings, which had not been known before. It characterizes the derivation from the antique, that the ceiling received the names of "himilezza" or"gehemelze"(heaven) from the decoration by stars transferred from the antique. Simple, but representative for the entire middle ages, the stairway was usually placed outside the building, generally ascending in one straight flight and ending in the usual porch before the entrance doorway. By the design of the upper story it further became necessary to arrange side openings for light for the lower story; the name of these windows was "fenster", formed from the Latin fenestra, and also "augentor." But glazing these windows still // remained a rarity for a long time. It is itself preserved in rich churches and monasteries in countries of ancient civilization. The manufacture of glass was highly esteemed as an art. It was introduced first into England, and expressly as a "very great art, very suitable for the lamps of churcher and monasteries, or for the different uses of vessels." In the provinces of northern France and Germany this skill was introduced much later. The new form of house further had the disadvantage, if the traditional location of the fireplace in the midst of the house was retained, that the smoke could no longer pass out through an opening in the roof, and it molested the occupants much more than before.

Men have been satisfied by patience in many cases; but in i important houses there found place as a further increase of a architectural expedients the fireplace instead of the open hearth, i.e., a mantle to collect and the chimney to carry off the smoke. The close connection of the two is expressed in the singular confusion of the two conceptions; for the late L Latin "caminus", that designates the fireplace to us is first the name of the smoke flue; our German name of "schornstein" for this being derived from a portion of the fireplace, namely

the corbels supporting the hood for the smoke. With the design of such chimneys was connected a necessary change in the general arrangement. The fire was transferred from the middle of the room to one of its walls. We can now recognize again from later conditions, how strongly men frequently adhered to the old arrangement of the interior of the hall, since it is actually presented by the arrangement of the seat of honor and of the benches for retainers a strikingly clear expression of the retainers and feudalism of the middle ages. The necessity of giving up this entirely customary grouping of the courtiers around the hearth fire, if men desired to place an upper story over the important hall, must have strongly restricted the further extension of the architectural form. The chimney place therefore first came into use more for smaller living rooms; but in such it appears to have been extended soon rather commonly for princely and monastic uses. The conception of the " "caminata" or later "keminata" as that of such a living and sleeping room capable of being heated, already belongs to the fixed ideas of the Merovingian period. Beside such influence in structural details, the influence of the richer Roman life appears in the borrowing of entirely new ideas. For example, there arose the necessity of building granaries ("speicher"; Latin spicarium) from the cultivation of grain according to Roman customs; from the model of the "cellarium" men learned to build cellars, at first entirely as a storehouse above ground and not as a subterranean room in the modern sense.

13. Buildings of Theodoric.

All these influences of a foreign important existence naturally first affected the extensive courts, that princes and kings built as residences. In them can we soonest find presented the degree of influence. Unfortunately only very little e evidence has been transmitted to us from the earliest ages of adjustment. Of the highest importance would be to us all knowledge of the age, in which under the great Ostrogoth Theodoric sought to fuse German rule with Italian civilization, in which under careful preservation of the traditional,not only of Roman administrative forms and legal principles, but even the court etiquette were retained. On all these matters we are r

relatively well instructed; but of the buildings of the great
12 Ostrogoth we know little, that is tangible. Men indeed beli-
eve that in extensive terraces near Terracina may be recogniz-
ed the remains of a great palace of Theodoric; but even if th-
is conjecture be correct, they tell us nothing; for all actual
buildings, that stood on them, have long since vanished witho-
ut a trace. Still more in the domain of the imagination belo-
ngs the significance of the mediaeval coins and seals, on whi-
ch one might see the Veronese palace of Theodoric. These rep-
resentations certainly date only from a much later time; the
style of the buildings represented entirely corresponds to wh-
at we might expect from about the 12 th century, and thus rem-
ains as their sole connection with the Gothic king the probab-
ility, that the buildings, which are represented in these str-
ongly conventionalized illustrations, stood on the same place
on which before them rose the castle of Dietrich of Berne. Ju-
st as little can be obtained anywhere a vivid idea from an ap-
parent remnant of the Palace of Theodoric at Ravenna. Already
according to the earlier opinion could it be regarded as at
most a gateway of the plan of the entire palace, therefore
scarcely affording a starting point for the style of the lat-
ter. It has recently been made very probable by Ricci, that
the entire structure only dates from a later time, about the
12 th century. With this entirely agrees the late Byzantine
treatment of the forms of the building, and we must indeed st-
rike it from the list of Ostrogothic structures. It is no bet-
ter with the so-called Palazzo delle Torre at Turin as a build-
ing of the Lombards. The illustration contained in the first
edition of this Heft is reproduced from older drawings; it th
therefore lacks the passages covered by great voussoir bricks
in round arches, which prove that the structure was in general
not a palace, but a monumental city gate, similar to the Porta
Nigra at Treves. Its origin may be ascribed with tolerable c
certainty to the late Roman imperial period.

Thus there remain only two evidences of the great secular a
activity of Theodoric. One is his Tomb, that building still
enigmatical in much, from which we can recognize, apart from
all conjectures relating to it, that Italian architecture in

that case offered no resistance to the intrusion of unusual a architectural ideas. But we can deduce therefrom, that even house architecture itself soon adapted itself without great o oppbsition to the novel cusctoms of the conquerors. This is also expressed by the representation, that exhibits in the mosaics of S. Apollinare at Ravenna the Palace of Theodoric also at Ravenna, and transmits to us the second monument of his age. (Fig. 7 [8]). The whole gives us a conventionalized picture of the city of Ravenna, designated by the inscription on the gateway as "civitas" (city) of Ravenna." In the foreground is the palace of the monarch, or rather its principal buildings in conventional simplification, that represents the hall or the "palace". It forms a central hall extending backward and two low transverse halls adjoining its sides. All rooms open in front by arches on Corinthian columns. Above the low side halls appears to have been an upper story, the "solar". The circumstance, that similar arrangements are again found in later times, may indeed make it appear possible, that in spite of the thorough conventionalization of the detail forms and of the surroundings, the chief elements of an actually existing building are here represented from nature. In any case is it an architectural form, that would still be foreign to the slightly earlier Palace of Diocletian in Spalato. We can perhaps see in it the antique conception of the ancient three-aisled princely hall.

Note 8. Mothes, O. Die Baukunst des Mittelalters in Italien. p. 191, 192. Jena. 1884.

But the wildest storms soon raged over Italy. The destructive conflicts in which the Byzantines contested the land with the Ostrogoths, then the desolating invasion of the Lombards, so deeply affected the life of antique civilization and art, that only a few remains of ancient skill in handicraft continued, only in the case that the ornamental impulses, that from Byzantium and the far East were busied here in a disjointed w way, but certainly were no longer strong enough to form and d develop new types. For a long time Italy no longer comes into consideration as the leading country in our branch of architecture; France enjoyed under the Merovingians a tolerable quiet, both internal and external, and it soon passed to the first place.

14. Merovingian.

The court of the Merovingians is evidently influenced by st starting points of all kinds, so that Viollet-le-Duc could attempt its restoration by an illustration.[7] The Palace de la Verberie near Compiegne no longer remains, and Carlier [8] gives a description on the basis of the ruins, which he had seen, as well as on a permit of Francis I, that allowed the removal of a part of the building, and this indeed leaves much to be desired in clearness, but presents many valuable conclusions. The great hall structure will be particularly mentioned here, placed at a great court and forming the termination on the West. This hall building was called "Mallobergium" in Latinized German, indicating its purpose as a seat of justice. The entire plan had from East to West a length of 250 toises or about 393.7 ft.; the chapel formed the eastern end, the erection of which was attributed to Charlemagne, and which still bore his name in the 14 th century. Between the two was a well arranged long row of buildings of different kinds and heights; for soldiers and important courtiers, for artisans and their equipment, and for agricultural purposes. The centre must have been occupied by a splendid two-story structure of greater height. It is indeed to be assumed, that it was the Mallobergium. Thus we find here again the grouping of smaller and larger buildings, so characteristic of the earliest times; likewise in the sense of the German conception without any fortification whatever. But the whole is yet arranged with the palace and the chapel at the ends, brought into strict order. We can indeed recognize therein the influence of a mind trained in the antique, and view in such a royal court the transfer of the antique suburban villa into new conditions. We know nothing of the method of construction; yet the circumstance that the buildings remained so long permits the conclusion for stone construction.

Note 7. Viollet-le-Duc, E. Dict. Rais. d'Arch. Vol. 7. p.1 et seq. Paris. 1875. -- Partly from Thierry, A. Recits de Temps Merovingiens. Recit 1.

Note 8. In Histoire du Duche de Valois. Vol. 1. Book 11, p. 169. Paris. 1764.

15. Works of Charlemagne.

Entering more into details, Charlemagne then sought to win the acquisitions of antique civilization for German life. In a predominating literary, yet also in practical work were men busied under him in imparting to the revived dignity of the Roman empire the corresponding magnificence by architectural activity as well. Good fortune had preserved remains of successive buildings, with which he equipped his important royal courts, the palaces at Aix-la-Chapelle, Ingelheim etc., together with instructions and suggestions, that he introduced for the management of his smaller landed estates. The latter in particular afford us a tolerably distinct idea of what such royal manors included in structures and other equipment, and which we must regard as best equipped in their vicinity.

16. Carlovingian Royal Courts.

One of the largest farmsteads of its time was the Royal C.urt Asnapio, which is described for us in the "Breviarium rerum f fiscalium".(Report on fiscal affairs).

It is enclosed by a well fortified palisade, has a stone gateway with solar above and contains not less than 25 separate buildings. The royal hall as the most important of these is built of stone in the best manner; it contains 3 chambers, i.e., state apartments. It is surrounded by porticos and is furnished with 11 rooms (pisiles) in the upper story indeed; also with storeroom and two vestibules. Beside it stand in the court area 17 houses with a single room each, a stable, kitchen, bakery, 2 granaries, and 3 stables for horses. A smaller portion of the court is enclosed by a separate palisade as a farmyard.

From this results the representation of a quite extensive design, that in the principal building in several stories and its upper story with numerous rooms far exceeds the ancient custom. it is certainly one of the largest courts described. Several others possess main buildings with but two rooms each in the lower and upper stories; in one we find indeed the royal dwelling again built of wood "in the usual manner" and having but a single chief apartment, thus being erected entirely in the manner customary from the most primitive times. Likewise the indications of household management require primitively enough,

when prescribed, that the houses shall have hearth fires, that they shall even further have the necessary equipment and tools, such as beds, table linen, drinking cups, vessels of all kinds, chains and axes, borers and cutting knives, so that it should not be necessary to borrow these elsewhere. Thus here in even the royal residences, in the authentic description of advancement clearly visible from German influence, that expresses itself in the subdivision of royal dwellings into separate rooms, with manifestly unbroken in the usual life, the prevailing primitive simplicity and lack of restraint in the entire conditions of life. But these must naturally exercise their influence in the execution of the details of the general plan as d described. This affords for us the best support in judging t the frequently dark and mysterious remains, that have continued
15 to us from the palaces of the great king. As such were mentioned Nymwegen, Ingelheim and Aix-la-Chapelle. The former may be omitted from our consideration, since the plan was thoroughly restored by Barbarossa, and was then destroyed in the year 1794, checking it by existing drawings therefore being impossible.

17. Palace at Aix-la-Chapelle.

The imperial Palace at Aix-la-Chapelle, in which was certainly embodied the highest degree of architectural ability then available, is proved in the main lines of its general plan, in that the two main buildings, the hall structure and palace chapel, that as in la Verberie (Art. 14) lay at the ends of the court, the hall being indeed at the North and the chapel at the South, and in their ground forms, these are yet preserved. The palace chapel forms the Minster at Aix-la-Chapelle, now being the Cathedral Church of the city, and as an important ecclesiastical structure of its time, it was treated in Part IV, vol. 3 of the first half of this Handbook. The hall building is given, at least in location and outline in the foundation walls of the existing City Hall. The area between the two buildings, later occupied by the market place, extended from the Minster to the hall structure on the hill. It was about 328 ft. long and 164 ft. wide, and as a palace court was surrounded by galleries, that afforded a passage, protected against weather, b

galleries were found, and thereby the entire desgn is certainly fixed in the ground plan. On the contrary its construction in details is entirely doubtful, and it indeed appears somewhat sanguine, to represent these as porticos, two-story whereever possible. The repeated destruction of these halls, that are narrated to us, rather permit the assumption of wood as originally the building material.

Around and outside the vast portoco court thus enclosed must have been placed the varied buildings mentioned in the ancient descriptions, for the state apartments, the imperial family, the life-guards, the cathedral foundation, with baths etc.; yet the conjectures [9] made concerning the exact arrangement are only very uncertain and therefore valueless to us. On the contrary, the hall building is valuable. It stands on the foundation of a Merovingian structure, that here probably formed a plain and probably two-story hall of about 5568 × 144.4 ft. in the clear. Charlemagne erected on this substructure, elevated about 11.5 ft. above the palace court, a new principal story and extended this hall by the addition of a great apse at the western end, whose masonry remains to us in the later Granus tower of the City Hall; he further added two smaller a apses to the longer sides. Thus he secured a substantial heightening of the internal effect with also in the apse an imposing elevated seat for his own person. Supports of wood or of stone also here supported the wooden ceiling of the hall. Whether this hall structure, the palace hall (palatium) had another and upper story must appear very doubtful. But this certainly was the case for the dwelling of the emperor, the "aula"; [10] for we learn concerning it, that the emperor through the wind-
/6 ow lattices of his "solar" could oversee all that entered or departed. [11] Of this dwelling we know further, that it must have possessed a ground plan unusually developed for its time; for it is stated, that the Greek ambassador must pass through 5 rooms to reach the apartment of the monarch. The further statement, that all dwellings of the countries projected above the ground, so that visitors to the palace could shelter themselves beneath them from bad weather, and yet would not be concealed from the eyes of Charlemagne, appears to me to indicate

merely the court porticos previously mentioned. With at least equal right, one may see a reference to buildings, whose lower stories each rose above ground with four entirely free wooden posts, as in the oldest wooden houses of Norway, though perhaps in a somewhat more developed form. Therewith must indaad be connected a substantially original idea of all that existed at the Palace, besides the monumental structures of the Minster and of the imperial Hall. [12]

9. To the attempt at restoration of Stephani, worked out with great love from the written sources, but in details with a leaning toward the plan of the Monastery of S. Gall (Art. 26), he himself added the remark, that nine tenths or even more of the results were based on the imagination.

10. That this "aula" is not identical with the "palace" is indeed conclusively proved by the statement from the council records of the 17 th century, mentioned by Rhoen (Die Karolingische Pfalz zu Aachen. p. 73. Aix-la-Chapelle. 1889), that the ground area of the "aula" was subdivided into lots after the fire of 1656, and that dwellings and guild halls were erected thereon.

11. Compare the corresponding passage of the description of the monks of S. Gall in Rhoen, p. 54.

12. That these forms of buildings produced by the natural conditions did not exactly appear unpleasing at a very much later time, we may see from the representation of the City Hall at Nievstadt in Limburg, still existing at the end of the 16 th century, which M. Schweisthal reproduced in his Essay of "La Halle Germanique et ses transformations." p. 21. Brunswick. 1907.

13. Later Carlovingian Buildings.

That the indications here given did not always first pass away without traces, is shown by the buildings of Louis the Pious. The famous so-called Portico of the Monastery in Lorsch (Note 46) gives us good evidence for the previously mentioned spirited descriptions, with its graceful, even if somewhat stiff arrangement of the pilasters and the rich decoration of i its covering of variegated marbles. Similar influences of a more technical kind are seen in the careful execution of the

churches influenced by the class of Charlemagne and preserved in several places. And in other respects the main building of the Palace at Ingelheim, a structure that probably belongs more to the time of Louis the Pious than to that of Charlemagne, exhibits influences from the Palace at Aix-la-Chapelle, when in spite of the insignificance of the existing remains and beside a probably three-aisled imperial hall, it permits the conjecture of the existence of a dwelling containing numerous rooms. Likewise the frequent use of stone columns, whether to subdivide the windows or to support the ceiling, is certainly proved here, and the importance of such knowledge is increased by the express statement, that the structure was executed by native workmen.

Thus these great Carlovingian palaces always give us the impression, that by force of the imperial power on them, a considerable advance was made beyond what was before common. It
19 is further important, that this progress was only possible by adherence to antique models, so that it may be said to have formed a precipitate of a learned and literary movement. This must lessen very much its influence on other peoples, as even the use of the acquisitions on the modest imperial courts stood in the way. We shall return to this in another place. Thus the advances of the Carlovingian palace may indeed be recognized in the imperial and princely buildings of a later time, of which they were the prototypes; but it is then not to be thought, that they so soon came into general acceptance in the use of the important men of the people. This was assuredly not the case, at least for the northern countries possessing capability for development. There has the national wooden construction in its simplest form remained alive far beyond the period described, as well also as the plain ground plan with a s single room for dwellings. Yet if architectural development permanently advanced, if the just mentioned innovations became generally common; then this took place in a different way, substantially under the protection and on account of the monastic societies, which therein played an extremely important part in the history of civilization. The architecture of the monasteries took the lead for centuries after the fall of the Carlovin-

Carlovingian magnificence; it formed the connection, which transmitted to the ruder peoples on this side of the Alps from the inheritance of the antique so many suggestions for the design of the more developed arrangements for dwellings.

/8 I. DESIGN OF BUILDINGS.

Chapter 1. Dwellings of the Monasteries.

19. Beginnings of Monastic Life.

The tendency to withdraw one's self from the disillusions of life into peace and by pious meditation of severe penance to seek a closer union with God is a primitive oriental phenomemon. By the intermediation of the wonderland of Egypt, it was also transferred from the East to the western nations and to Christianity. There was already formed in the second century the first free society of pious colonists under the leadership of S. Anthony, pledging themselves to poverty, self-denial and unreserved devotion to God. Already about the year 340, S. P Pachomius then founded in the Thebaid the first strictly combined monastery, which soon grew to great magnitude, and from which later branched a great number of daughter monasteries. Many of the ground principles there established continued to exist permanently; others occurred at a much later time as renewed customs. To the first species belonged the duty of obtaining a living by personal manual labor, and the preparation for the binding vow by a time of trial (noviciate). To the s second group pertains the subjection of the daughter monasteries to the right of visitation from the mother monastery, and the custom, that the priors of the separate monasteries should gather at regular intervals at the principal monastery for common counsel. By the founder of the Order of S. Basil, yet flourishing in the Greek Church, S. Basil (d. 379), these rules were made more rigid; still there yet existed the practice of freely traveling bands of monks. Characteristic of thes freer kind of the original monastic life is also the circumstance, that even the Council at Chalcedon in the year 451 still placed the monks among the laity and not with the priests.

The monastery plan of these oriental monastic orders, termed a "laura", is evidently dependent on the fact, that the origin of this monastic life is based on colonization. It consisted of a number of separate cells, which were mostly placed around a spacious court. In the midst of the court rose both the church and the common refectory with the kitchen and attached rooms. Between these two buildings was found the well, as a rule.

Manifestly in substantially similar forms the monastic life penetrated into western Europe after the middle of the 4 th century, furthered in Italy and Africa by the Church Fathers Athanasius, Ambrose and Augustine, in Gaul by Bishop Martin of Tours, and it soon greatly extended. But it appears, that already early and besides the free imitation of the oriental con-
19 ception, the original idea of colonization was affected by the German custom of a train of dependants and the connected habit of gathering together in great princely halls.

2.. Benedictine Order.

After various attempts, this fusion of two basal ideas received its fixed form by the rules for the Order by S. Benedict of Nursia (480-543), by which monastic existence in the West was permanently and most deeply influenced. These adopted from the earliest monastic societies the vows of poverty, chastity and obedience, also the rule of individual self-support. Meanwhile the severe command came to not locate the cloister in a city, but away from the pursuits of men, and finally to never leave the monastery domain, except for imperative necessity, carried this rule further to the conclusion, that everything necessary to life, should be produced in the monastery itself. Thus was the foundation laid for the extensive transformation of the monastery, not only by all buildings for industrial work, mills, breweries, wine-industry, but also by trade workshops of all kinds, from smithing and wagon-making to the exercise of the goldsmith's art, copying manuscripts, miniature painting etc. By this impressive occupation with all mechanic, artistic and scientific labors, the settlements of the Benedictine Order became true localities and centres of civilization, and in the wild centres of the earliest middle ages almost the sole intermediaries for the remains of antique artistic and architectural knowledge. Architecturally of equal importance are the rules, that regulated the lives of the brothers in details. Basal indeed is here the prescription, that the brothers, indeed all in one bed, but yet all possibly together, or otherwise each 10 to 20 under a dean, rested in a common dormitory, where a light should burn on account of seeing better. The brothers must sleep in complete clothing

and girded, in order to be prepared for the nightly divine service. Likewise was a common midday meal prescribed, at which in rotation those most capable should read from the Holy Scriptures. The other subdivisions of the day were exactly prescribed. The working time comprised 8 hours in alternating arrangement, but only 7 hours in fasting periods. These were substantially fixed by the arrangement of divine service, which united the entire brotherhood seven times daily and once about midnight. Even the recreation period between those of labor was in great part devoted in common in the dormitory to the study of the Holy Scriptures. The monk living alone in his cell in meditation according to the popular conception was therefore in nowise embodied in the mediaeval orders.

Of less importance in architectural respects **for us** are the severe rules relating to living, eating and drinking, and to clothing, to the deportment of the brethren toward each other and to their various officials, the subjection of the monastery to the bishop of its diocese, the rank of the abbot, his power of punishment etc. More important are the requirements for admission; these were very strictly conceived. During a test period of one year the entrant had to prove the strength of his purpose, whereby the plan of separate rooms for these "novices" became necessary. There also appears very clearly by the diplomatic conception of this period, that even then by the acceptance of the bringing the corresponding means or the endowment of a sum by the parents was the rule. It corresponded very well with the distinguished character of the community, that also the existence of serving helpers besides was expected as self-evident, and further that he was expressly warned against discontent, in case by local conditions the brothers were compelled to gather the produce of the fields with their own hands. We must conclude from this, that the coarse personal labor was not generally the affair of the brothers, but that these were limited rather to the oversight and management. Moreover the rule of Isodorus Hispalensis expressly assigns the work of agriculture and building to the serfs of the monastery. In spite of the truly strenuous and hard life, that the previously given order of the day brought with strict

adherence, also the rules on the mode of life in regard to table arrangement and drinking were conceived entirely in the sense of a well to do and richly living class. Thus from the first the rule resulted a wider scope for the development of monastic life in the aristocratic sense. And that the development generally took this direction is thereby further proved, in that all reformers of monastic life, all founders of new o orders, sprang from the higher and in part the most important class of the people. Also from the undoubted given possibility, that likewise gifted scions of the lower classes entered the monastery and might play a prominent part therein, the monastic brotherhood in nowise exercised admission without choice, but a selection from the best. If this conception of the older monasteries as substantially aristocratic societies does not exactly correspond to a different popular opinion, then it is still not impossible, if the great part played by the monastic life in the civilization of the middle ages be considered, as well as the imposing conception of its architectural expression. For the like reason have the rules of the Benedictine Order afforded the model for the statutes of the distinguished "colleges of canons", that gathered at cathedral and foundation churches, and whose first rule was issued by Bishop Chrodegang of Metz in the year 760.

The rule of S. Benedict certainly owed its predominance for centuries, besides its high moral value, to the circumstance, that it was capable of adapting its entire conception to the most varied conditions, while it left a tolerable scope for the option of the abbot. There was always opportunity, that under an incapable abbot, carelessness and insubordination should creep into the community. Throughout the entire middle ages therefore always continued renewed efforts to restore again the relaxed discipline by increased severity in the rules of the Order. Most important for our consideration are the successively related foundations of the Cluniac and Cistercian Orders.

21. Order of Cluny.

The founder of the Order was a Count Bruno of Burgundy, who in the year 910 took charge of the already existing monastery.

Determinative for the behavior of the new community remained the rule of S. Benedict; yet it was made more severe by the requirement of manual labor besides the copying of manuscripts; also permanent silence was demanded of the members. The Order did not owe its importance to these increased severities of the old rule, since the German movement with the same purpose, that proceeded from the Monastery of Hirsau, attained no comprehensive efficiency. It reached power by the great worldly and political part assigned to it to play, certainly not in accordance with the intention of its founder, and through political complications, it again sank from its proud height. The influence exerted on church architecture by the Cluniac Order and the Hirsau congregation is to be described in a different portion of this "Handbook"; for the monastic life is of importance in two directions. First it withdrew the individual monastery from the influence of the bishop, placed the entire community directly under the Pope, and by the dependence of many monasteries on the mother monastery of Cluny began to effect a closer uniformity of the orders. Otherwise it had first also taken a number of serving helpers, mechanics and other indispensable assistants into the internal economy as "lay brothers" in the closer brotherhood of the monastery, and thereby first made possible the strict isolation of the closed monastery domain from the outer world.

22. Premonstrant Order.

In not too long a time was it likewise made worldly by its active participation in secular affairs, and it became luxurious, so that almost at the same time in two different places appeared new endeavors after reforms. S. Norbert, earlier chaplain of Henry V, founded in Premontre the Order of Premonstrants in accordance with the rule of Augustine, which was collected from the writings of S. Augustine with numerous requirements similar to those of the Benedictine rule. His aim was to practice a severe monastery discipline combined with an active and contemplative life with the preaching office, care of souls and scientific work. This Order is mentioned here, since it acquired considerable importance in the settlement of t the East, in the region of the Elbe and in Austrian lands; but

it has not left behind it vestiges of impressions in monastic architecture.

23. Cistercian Order.

The Cistercian Order became more important, and it was founded by Abbot Robert de Molesmes, a Burgundian noble, in the year 1098 in a wild forest region near Citeaux (Cistercium). He set before himself as his original aim and purpose the making of the Benedictine monastery discipline more severe by hard manual labor, particularly by reclaiming waste lands, together with the renunciation of furthering the external adornment of life. By this devotion to opening unfruitful lands, that later evidently developed special skill in the drainage of swampy regions, an important role in the furtherance of civilization fell to the Cistercian Order; it had rapidly extended to a previously unknown magnitude, so that in the 13 th c century 1800 monasteries in Europe must have belonged to it. Certainly also for it, and perhaps most quickly, the rich produce of recently cleared arable lands frustrated the aim of i its original founder. Wealth and with it luxury soon penetrated into its monasteries; the most important and richest designs of monasteries, left to us by the middle ages, belonged to the Cistercian Order.

The Cistercians again adopted for the preservation of monastic discipline the archaic oriental custom, according to which each daughter monastery was dependent upon its mother cloister and was governed by it. Accordingly the oldest foundation of Citeaux in combination with the four eldest daughter monasteries of La Ferte, Clairvaux, Pontigny and Morimond, possessed supreme power over all monasteries of the Order, and with the Abbot General at Citeaux gathered annually all the priors of all monasteries for counsel on ordinary cases. Such a strict connection must naturally also influence architectural matters. Thus the Cistercian monasteries, not only in richness, but al-
22 so in the isolation of the type, form a termination of this branch of mediaeval architecture. Characteristic for their d design is the circumstance, that besides the precepts of the rule of S. Benedict, the Order adopted from the Cluniacs the arrangement of "lay brothers", and afterwards strengthened

the exclusion from the outer world by the prohibition of all activity outside the monastery, including the care of souls.

With this arrangement substantially ended the transformation of Benedictine monastic life; later types of orders, based on other foundations, will occupy us in other places.

24. Ground Form of the Monastery.

The architectural forms in which the affairs of a monastery-- a little world in itself -- were transcatedl naturally did not proceed in completed form from the head of an artist, but gradually gathered from simple beginnings. All western monasteries were developed in common in this, that the rooms devoted to the common uses of the community, i.e. of the monks or nuns alone, as a basis were arranged around a rectangular court surrounded by porticos, the "cloister", in contrast to the housekeeping court used for the more public affairs and designated as the "clausure." The origin of this monumental architectural form is observed in this, that in the earliest period of western monasticism the clergy of the church erected their cells around the atrium of the Early Christian basilica, surrounded by columns.

In close connection with these propotybes men also later still occasionally placed the cloister at the western end of the church (the primitive foundations of S. Gereon and of S. Maria im Capitol at Cologne are examples of this); but generally on account of greater isolation the location at the side of the church was preferred. When this change was completed is unknown; it is only certain, that in the great monasteries of the Carlovingian period we meet with it as already fixed.

25. Monastery of Fontanella.

According to accurate contemporary descriptions, the plan of the Monastery of Fontanelle near Rouen is restored (Fig. 8 [13]), just as Abbot Ansegis (822-833) completed it at the close of a long period of architectural activity. Our illustration reproduces the dimensions of the buildings as mentioned in the Chronicle. We see the cloister built in rectangular form on the north side of the Monastery Church. Next it lies at the west the common sleeping room (dormitory), above the middle portion of which was placed a richly decorated solar. Opposite

and extending nearly to the apse of the church, thus leaving space there for a passage, vestiary or sacristy, extended a wing, that contained the refectory and the storeroom. Both wings were connected by a large building in which were arranged the storeroom for utensils and for clothing, and further the dwelling for the abbot, together with other apartments. As a place for the solemn assembly of the monks, at which the daily reading of chapters from the Holy Scriptures also occurred, served the southern wing of the cloister, built against the c church, which like the assemblage of the brothers itself has permanently taken the name of chapter. Separate structures f for the archives and the library further existed; a tower with a spire 35 ft. (?) high stood detached beside the church. The Basilica of S. Servatius is further mentioned in the description and may perhaps be taken as a cemetery chapel. Nothing is
13 learned of the housekeeping and administration buildings, grouped about the clausure; yet without these the plan is very notable as an example of a not fully developed design.

Note 13. From Schlosser, J. Die abendländische Klosteranlage des frühen Mittelalters. p. 29. Vienna. 1889.

26. Plan of S. Gall.

At the same time as the completion of the Monastery of Fontanella is placed the preparation of the famous plan of S. Gall, that was described in Part. 2, Vol. 3, second half, of this H Handbook. It substantially corresponds to higher and more fixed conditions, and proves that in the Carlovingian empire the development of monastic designs was quite rapidly completed. This entirely agrees with the historical statements, that especially for the western Frankish domain speaks the great activity in the founding and erecting of new monasteries, forming a counterpart to this, that also the ground form of the church during that period experienced its first development by the addition of the choir square to the transverse aisle. The plan of S. Gall is priceless for the recognition of the many-sided changes, that were made in a great monastery of that time. Besides the proper living and residence rooms of the monks, the clausure, it exhibits the view of a common life furnished with all the arrangements for an independent existence, with build-

buildings for all sorts of agricultural purposes, for handicrafts of every kind, for imparting instruction to the novices of the monastery, as well as to the youths placed in the mon. astery for a time. To these was further added a separate building for the dwelling of the abbot, necessary because at the the dignity of abbot was conferred by the kings on the laity like a secular fief. There were also provided a hospital with the physician's dwelling and bath house, together with other hygienic arrangements for the monks; likewise structures for the reception and separate lodging of both important guests and simpler travelers and pilgrims, as well as of foreign monks. Further the requirements made by the developed monastic life are met in the clausure in a form, that was adopted with slight changes to all later alterations in the rule of the Order, thereby remaining determinative for later times. Thus the dormitory was here placed in that wing of the cloister adjoining the choir of the church, therefore affording the most convenient access to the nightly divine service. Further the refectory was alread referred to the later permanently recurring
24 place opposite the church, but on the contrary the storeroom retained the western wing as that nearest the business of agriculture and the animals, placed farthest from the inner life of the clausure. Likewise here the wing of the cloister adjoining the church was used for the meetings (convent) of the brothers, as in Fontanella.

The entire design was intended for execution in stone throughout, at least the principal buildings, the church with the buildings around the cloister, as well as the hospital and the school with the cloisters appertaining thereto, the abbot's house, and indeed also the adjacent kitchen, as may be concluded from the inserted arcades. One may determine the same from the other buildings from the fact, that heating arrangements are frequently inserted; yet such a conclusion is uncertain f for simple and undeveloped conditions. In any case the execution of these main buildings in stone denotes a great advance from the condition of the national architecture.

27. Stone Construction of the Monasteries.

The preference of important stone construction by the monast-

monasteries, which indicates their position in the general life of the people, doubtless refers back to the southern prototypes, in which it was self-evident. We may assume it already for the earliest plans of the Merovingian period, so far as t they were erected on secure ground and with sufficient means. On the contrary at other places and even at a later time, one may have strong doubts, whether the first design was not executed in the wooden construction common in that country. The frequently mentioned passages in the chronicles, from which it follows, that Boniface erected his loved foundation at Fulda in the year 744 at once in stone construction by means of mechanics brought with him, does not actually mean this. [14] It ascribes to him only the clearing of the forest from the chosen place and the construction of arrangements for the preparation of lime. Since it expressly states, that after 8 days he already went away with his workmen, it is much more probable, that the introduced manufacture of lime had for object the making of lime wash, and not stone construction, for the execution of which trained labor was still lacking in that forest wilderness. But aside from such single cases the ecclesiastical founders in any case broke a path for the extension of stone construction, thereby doing great service for the progress of architectural capabilities. Indeed the contemporary enthusiastic statements concerning the splendid structures originating then must be accepted with a certain caution. Part express in their conception a certain sufficienly, a fresh capacity for reception, not accustomed to the sight of important architectural structures, and part the awkward mode of writing in that time, which in every animated description was accustomed to strive for the strongest expressions. Characteristic of the art work of the earlier period is then the description of the great architectural ability developed by Abbot Desiderius of the great Monastery of Montecassino soon after 1050 in order to erect t this mother monastery of the Benedictine Order in new splendor. It appeared to him as self-evident, that the best preparation was to journey to Rome and to purchase there columns, bases, capitals and colored marble slabs from the antique ruins, that were then transported to Montecassino and employed for the dec-

decoration of the buildings.

Note 14. See Richter, G. Die ersten Anfänge der Bau- und Kunsttätigkeit des Klosters Fulda. Fulda. 1900.

In Fig. 9[15] is further given a representation of the old cl-oister portico of S. Gerusalèmme in Bologna, which shows to
24 what chude forms could descend the rich architectural idea of heavy wall arches resting on four dwarf columns. The structure probably dates from a restoration of the monastery, that foll-owed destruction by the Hungarian invasion of the year 903.

Note 15. From my own sketch.

28. Abbey at Canterbury.

The numerous starting points given to us by the plan of S. Gall for judging the house architecture of that time make it a highly important source of information for the history of art. In order to form a vivid picture of the appearance of such a monastery, it is less suitable, since without regard to the local peculiaritäes, it rather represents by a programme the regular requirements, than gives just an architectural scheme. But there has been preserved to us another mediaeval drawing from a little later time, in which the plan of the gr-eat English Abbey of Canterbury is so represented indeed in a naive but a thoroughly clear manner, just as it was construct-ed after the fire of 1070. It served at that time for a super-intendent's drawing, in order to record the arrangement of a well conceived plan for water supply and drainage. All build-ings are given in such a manner, that their elevations in geo-metrical representation are revolved down into the plane of t the diagram. See the adjacant Plate.[16]

Note 16. From Willis, R. History of the Monastery of Cant-erbury. Reprinted in the Architectural Review. Vol. 3. p. 1 154, 155. London. 1897 - 1898.

We first see the entire monastery enclosed by simple defens-ive outer walls and further surrounded by the city wall. This variation from the rule of S. Benedict (Art. 20) is easily ex-plained here, since the city was only developed later under t the protection of the monastery, and the monastery lying in t the open fields was then included within the extended walls, as so frequently occurred. On the domain enclosed by the mon-

monastery walls, there lies the church on the upper margin of
our Plate, i.e., on the south side of the plan, already having
the elongated choir so characteristic for the later time in E
England. A tower over the coossing as well as two towers at
the east and west adorned it; the former bore on its apex the
figure of the archangel Michael with four wings (which is also
mentioned as crowning one of the towers of S. Gall); the others
terminated with the figure of the vigilant cock and with wrou-
ght iron crosses. But there was further erected on the south-
ern adjoining churchyard a low bell tower (campanile). On the
north of the choir of the church was added the small vestiary,
the room for the preservation of the costly vestments, curtai-
ns and altar covers, in which particularly consisted the weal-
th of church treasuries in the early middle ages. Otherwise
this part of the building was free and was separated by a nar-
row court from the adjacent portions of the monastery. On the
other hand the western part of the church adjoins the cloister
for its entire length. It was enclosed by low round-arched
porticos; some of their openings at the eastern side were clos-
ed by grilles and were designated as places for speaking to
strangers. The rooms located over the eastern wing in the up-
per story were lighted by small windows, but nothing further
is known of them; as also generally later, they must have ser-
ved as low attics for inferior uses. The entire western wing
was occupied by the storeroom. In the eastern wing was first
26 found a room with shed roof leaning against the transept of t
the church, that indeed served as a sacristy and for preserva-
tion of the mass books etc.; then followed as the first examp-
le for us a separate chapter hall (capitulum), that occurred
here as an assembly room instead of the wing of the cloister
formerly serving for that purpose. Otherwise this wing was
occupied by the dormitory. The northern wing finally received
the refectory; before it rose in the interior of the cloister
a vaulted fountain house, in which were arranged the running
pipes for ablutions before and after meals, with two foiled
water basins, one above the other. On the external side of
this wing there lay in the western part another cloister-like
portico, that was again designated as a place for conversation.

It then naturally formed the transition to the world outside the cloister, when it opened toward a court adjoining the house for guests. North of that court lay another smaller one in which the cooking was done. The kitchen itself rose in monumental form on its northern side as a ventilated polygonal room, its angles crowned by smoke chamneys and with a vine trellis on the west side. A small building like an apse was attached solely for washing the fish; between the kitchen and t the refectory was inserted a low intermediate structure, wherein, according to the note, the entrails were cleansed and sausages were prepared. On the opposite side a wooden porch formed the connection between the kitchen and the refectory.

Adjoining these structures belonging to the clausure in the narrower sense was on the east a second court like a cloister, that was divided in two parts by an alley of trees. The western portion served as a kitchen garden for the cultivation of the necessary roots and medicinal herbs. A particular purpose was not assigned to the eastern part; it may have served the inmates of the hospital for recreation. This adjoins at the east thereof and was furnished with a separate chapel, vaulted kitchen and privy. In its vicinity lay the old and the new house of the prior, to whom may have been assigned the separate oversight of the hospital. At the north of the whole extended further the farm court, on which and next the dormitory was t the very conspicuous privy building. It exhibits a plan, such as also played a part in the somewhat earlier description of the Monastery of Farfa in the Sabine mountains. It was a basilican structure, along whose well ventilated middle aisle were arranged the low cells at the sides. In Farfa was it especially emphasized, that each of the 45 cells had its own windows; such are centainly not drawn here. Not far from thence we find the bath house with the storehouse, on the northern border finally being the brew house, the bakery and the granary. Further lay there with a separate monumental entrance the abbot's house in two stories, furnished with a fountain house, built before the lower story. -- Thus the whole affords an extremely clear representation of the diversity of the requirements and of the free certainty, with which they were met, some-

sometimes in monumental form, sometimes plainly.

The indicated water channels also contribute to the impression of a richly developed art of living, that the entirety makes, and they may therefore be briefly explained. First, two springs are utilized. One rises in the lay cemetery, then further supplies the fist pond, located east of the church, flows to the new dwelling of the prior, sending thence a stream to the privy of the hospital, which then leads past the great privy and obliquely across the farm court to the city wall. Another branch supplies the bath house, the brewery and the bakery, thence forms a connection with the abbot's house, and further supplies with a number of outlets the kitchen and ends in the fountain of the cloister. A second spring comes from the open land north of the monastery. It is frequently collected in basins, which reserve the water necessary for irrigating the grain field, vineyard and fruit garden. Within the monastery domain it is led directly to the hospital kitchen, turns thence westward to the vegetable garden, in which it supplies an elevated reservoir (again drawn in octofoil form), then further to the cloister, where it is likewise connected with the fountain.

But this was not sufficient. For the case that in summer t the springs were not sufficient, further precautions were taken. First the rainwater from the church roof was caught, and part was led directly to the channel, that fed the cloister fountain, part was collected in a second elevated basin in the southeast corner of the herb garden, from which a portion was led to the same places and a portion to the hospital. But for extreme need there were two wells at command. One is plainly drawn as a draw well with a sweep weighted with stone, stood in the cemetery and enabled the spring stream flowing thence to be increased. The other was found in the herb garden and
27 had beside it a "pillar" from which men drew in case of lack water, thereby being able to supply with water all places for its use, i.e., a standpipe that made it possible to fill the aforesaid reservoir.

We here have to do with an extremely complex technical plan, in which all possibilities appear to be well considered. The

care expended on such matters leads to a further conclusion, that at the time, so frequently held to be rude and unlcivilized, men in cultured circles placed a higher value on cleanliness and healthy pleasures, than in so many later and more enlightened centuries.

Thus already in the 12 th century, in which the contemporary secular architecture had first advanced scarcely to the beginning steps, in the architecture of the Benedictine Order all works satisfied a rich and diversified life; there remains but little to add, in order to create architectural forms, that were also adapted to the rule of the derived Orders, and consequently remained standard until the close of the middle ages.

29. Monastery of Maulbronn.

As an example of such a fully developed Cistercian monastery is chosen Maulbronn, as complete in plan and in architectural development as also well preserved. The plan of the location (Fig. 10 [17]) shows us at once, how the whole is separated into two parts.

Note 17. From Paulus, E. Die Cisterziencerabtei Maulbronn. 2 d edition. Pl. 4. Stuttgart. 1884.

First at the main entrance 1, here before the western facade. of the church, again lies the farm court of the monastery. T The buildings standing quite irregularly on it date from the most different times and serve for the most diverse purposes, such as stables, granaries (12, 13), mill (10), bakery (11), servants' house (15), cooper shop (17), cellar (18), etc. Just beside the gate lies the guest house (3) and the matins house (4), on the other side being the chapel of the Trinity (2). Such a chapel beside the gate belongs to every Cistercian monastery; it is intended to serve women for the performance of their devotions, who by the rule of the Order cannot visit the monastery church. -- On the east this farm court is bounded by the solid mass of the cloister buildings extending across the entire width of the site, thus of the monastery proper, which we have represented in Fig. 12 [17] separately and at the same scale as the other monastery plans menteioned herein. The most important place is naturally occupied by the church, begun soon after the founding of the monastery, erected as a Roman-

Romanesque pier basilica and completed about 1200. Westerly lies a grecaful porch added about 20 years later; on the north adjoins a long and narrow wing, which in order to separate the clausure as quickly as possible from the farm court, was built as the oldest part of the monastery at the same time as the church. It contains in room 22 the storehouse, that already in Canterbury occupied the same place, and which was placed t there regularly for simple and practical reasons. But beside it we see in this wing beyond the tunnel-vaulted passage to the interior of the cloister, those rooms which were particularly necessary by the cistercian rule; in room 23 the great refectory of the lay brothers or converts, above it being their dormitory. The very solemn and heavy treatment shown toward the farm court formerly by this wing is represented by Fig. 11 [19]; now the greater part of this imposing portion is indeed concealed by a porch added in the 15 th century and the adjoining and still later flight of steps. Behind the wing just mentioned is concealed the inner cloister, begun at the same time and in similar forms as the porch of the church, with the South wing attached to the church, extended further with the western wing about 1300, and during the 14 th century intermittently continued from thence beyond the fountain house to the completion of the east wing. Around it extend the chief rooms of the monastery. On the north wing at the middle lay the proud columnar hall of the masters' refectory (25), placed perpendicular to the direction of the corresponding part of the cloister, in order to obtain space, and therefore projecting far from the mass of the building. It was later designated as the "summer refectory,"after the common use of the winter refectory. It likewise dates from the building period of about 1220, and thus before the extension of the cloister lay for a good century detached from the other portion of the monastery constructed of stone. Between these two refectories was the now destroyed monastery kitchen 24; on the east adjoining the masters' refectory was the warmed room 26, a room very important for comfort in winter, the only one of such a rich monastery, that could be heated. Near by and connected by various picturesque stairways with the cloister and the warmed room lay the

brothers' or fraternity room (29 - 30, i.e., the room in which the brothers could remain during their free time), earlier a single connected apartment; behind it were still arranged other vaulted rooms for the wine press and the care perhaps of the best wines (31). South of the brothers' room a passage leads out from the cloister; beyond the latter and yet further in the eastern wing lies the chapter hall 28 with a beautiful chapel apse, dating from about the end of the 14 th century. A narrow tunnel vaulted room 21, that is to be described as a sacristy, concludes the apartments arranged on the ground floor around the cloister. An upper story only remains over the western and eastern wings. As already stated, in that was contained the dormitory of the converts and the storerooms; in this extended for the entire length of nearly 230 ft. the great dormitory of the monks, from which one could pass by a stairway as a rule directly into the transept of the church. These structures of the clausure proper were adjoined by some other buildings, that lay further east in the monastery garden. First the house of the abbot (34), in which he could attend to the management of the monastery and to the necessary and diversified business with the external world without disturbing the quiet repose of the clausure. It dates from the oldest building period of the monastery, but then about the year 1384, it was adapted to the requirements of a later time by a rebuilding, and finally about the year 1493 was brought into direct connection with the clausure by the erection of the new parlor (room 32 for visits and conversation). Finally the hospital 36 lies entirely detached, later designated as the prebendary house, and as important places of monastic life the "shaving fountain"38, at which the monks gathered each week for renewing the tonsure and for reading the Holy Scriptures. An accessory not belonging to the monastery life was finally the ducal chateau 35, which was only erected after the suppression of t the monastery.

Note 17. Later and after the strict separation of the converts and the monks was dropped, it was used as the winter refectory of the brothers.

Note 18. From Paulus, Plate 2. -- The striking arrangement

of the doorway in the upper story without any access leading to it is most simply explained by this, that this opening served as a hoist opening for raising grain etc. to the internal part of the upper story lying over the storeroom.

Note 17. From Paulus, E. Die Cisterzienabtei Maulbronn. 2 d edit. Pl. 4. Stuttgart. 1884.

Thus we here meet with an unusually rich and highly developed entirety. Characteristic for its kind is it, that there d did not fall to one age or to one architect the erection of t the entire group of buildings. We have endeavored in describing the plan to make clear the gradual origin of the whole. Just as here we almost always see it as a repeated procedure, that for a newly founded monastery, especially if it first originates in non-arable forest or a marshy region to be made c cultivable, it must at first be satisfied with the necessary shelter, later under increasingly firmer conditions, to first erect the church and then the other monastery buildings in monumental form. Thus Boniface proceeded in founding the first German monastery; the same procedure is shown by the architectural forms of our monastery as well. And it is undeniable, t that just in the abundance of ideas, that many generations have worked into such architecture in the alternation of different conceptions, that stand beside each other as variations on the same theme, there lies a deep artistic and historical chasm, which is absent from uniformly shaped structures. It is here impossible to even approximately reproduce the wealth in splendor of details and the impressive effects of the interiors, t that a monastery after the kind of Maulbronn contains; we limit ourselves to showing a few examples of the principal rooms and to giving in a bird's eye view a representation of its general grouping. We see how the forecourt or farm court is here clearly separated from the precincts of the clausure; how the cloister forms the fixed centre or nucleus of the whole, and how the enclosing buildings are related to its internal area; particularly how the north side of the clausure with the widely extended refectory buildings in contrast with the monumental western side entirely renounces all architectural effect e externally. The entire monastery is then enclosed by walls and

ditches; likewise some strong towers rise from the enclosure; but this fortification is not to be regarded as pertaining to
31 to the design of a monastery. It was also begun during the
32 political disorders of the ending 13 th and 14 th centuries, and was then strengthened in the contests against against each other by the protecting lords of the monastery, of Wurtemberg and the Palatinate.

30. Fortification of the Monastery.

According to the rule, fortification did not belong to the conception of a monastery; the monks, whose chief duty was humility, would have poorly succeeded in holdinm them during forays and political contests. Thus the monastery domain as a rule was surrounded by a simple enclosing wall, such as by far most monasteries still exhibit, and it trusted for the usual course of affairs to the reverent awe for the sanctuary and to the special peace of God, that all ecclesiastical possessions enjoyed. But against permanent encrouchment by worldly rulers care was taken to ensure safety by seeking for itself a ruler as guardian or protector. But how men protected themselves against unexpected attack by a great hostile power by flight a and withdrawal to an easily defended locality, the well known
33 statement by Ekkehard gives plain evidence concerning the behavior of the monastery of S. Gall during the Hungarian invasion of the year 926.

Since the unfortified monastery afforded no possibility of defence, already at the information that the Hungarians approached, the abbot caused the most important treasures to be taken to Reichenau, which by its situation in the lake was protected against attack by the mounted hosts of Hungarians. When the enemy actually approached, the abbot with the inmates of the monastery with all valuable property withdrew to a mountain forest nearby, collected the tenants of the monastery lands and the remaining people of the vicinity around himself, and with their assistance rapidly constructed a fort for the people by palisades and barricades, for the reduction of which the prowess of the enemy did not suffice.

This now did not prevent the protection of fortifications of such monasteries in countries newly won to Christianity, that

as advanced posts were particularly threatened by heathen att-
34 acks; yet under such conditions well regulated and architecturally developed monastery buildings could not in general come into existence. For countries of orderly civilization a fortification capable of resistance forms a rare exception. It then especially occurred if a monastery, perhaps founded on t the site of an ancient fortress, formed an important strategic point, and in such cases generally resluted plans, that differed substantially from those otherwise common.

31. Mont S. Michel.

A good example of such a differing plan is formed by the Monastery of S. Michel in Normandy,[22] which is located on a point of military importance and had a particular value for the defence of the country in the 13 th century, where the monks thus more strongly developed the defensive system at the cost of t the French king, than would have been the case otherwise, while the church developed into one of the most famous pilgrimage l localities in Christendom.

Note 20. From my own photographs.

Note 21. From Paulus.

Note 22. See Viollet-le-Duc. Vol. 1, p. 288 et seq. Paris. 1854. -- A similar example in Germany is presented by the Monastery of Comburg near Schwabisch-Hall from the 12 th century, yet which by the rebuilding in the 18 th century has lost more of the ancient chahacter than Mont S. Michel. Likewise there was the apex of the hill too small to place the monastery buildings beside the church according to the rule; there also the fortifications extending down the hill dominated the view of the monastery.

It occupies the top of a rocky hill located near the seashore on whose slopes extend down the living buildings of the monastery, then defensive structures enclose a little city and extend to the base, which is regularly washed by the waves, but is free at the ebb tide. We give in Fig. 17[32] the ground plan of the design directly beneath the church, whose crypt certainly extends deeper.

35 From the lower lying story one passes by stairs to the portal A, they by a stairway to the height E; D was the dormitory

of the monks and on the east the dormitory of the garrison; G are dwellings for guests, as well as that of the abbot. Beneath D was a similar hall, which likewise served the garrison, perhaps as a refectory. Otherwise the purposes of the different rooms can scarcely be determined. F is the substruucture of the transept of an older church, H that of its western portion, which today remains as the nave of the Gothic church. The room over I is regarded as the library hall. Over E is found a platform, that supports a court surrounded by a cloister, also adjoined on the east and west by other aisles.

32. More modest Plans of Monasteries.

Thus in Mont S. Michel to all diverse requirements of a rich monastery plan are added other rooms, that served for the defense and for a permanent garrison, so that a design of unusual complexity resulted. But not everywhere could one thus draw from an abundance. At other places again occurred a certain limitation, when it was required to prepare a home for a less wealthy brotherhood. First of all for more modest requirements the extent of the refectory was reduced, so that its end adjoined the cloister. The early Gothic Cistercian Monastery of Goldenkron in Bohemia possesses such an arrangement of plan with an entirely similar series of rooms to that in Maulbronn. (Fig. 18 [23]).

Note 23. From Mitt. der K. K. Central Commission zur Erforschung und Erhaltung der Kunst- und historischen Denkmale. Vienna.

In this illustration, a is the main entrance, that again leads between the lay refectory and the storeroom; b is the chapter hall, c the refectory and d the fountain house; between t the chapter hall and the church lies the stairway, that serves for a direct communication between the dormitory and the choir interior.

Yet much simpler conditions are indicated by the plan of the Monastery of Seligental in Baden (Fig. 19 [24]). The plan of t the Benedictine Nuns' Convent, founded in the year 1236 and f
36 flourishing for over 300 years, shows with how few and modest buildings one could finally succeed. They may complete the l lower limit of the view of monastic life and at the same time

give a picture of it, such as men might utilize for new foundations at first with temporary structures.

Note 24. From Bau- und Kunstdenkmäler in Baden. Vol. 4; 3. Circle of Mosbach. p. 199.

33. City Monasteries.

Monastery buildings must naturally be subjected to further changes, which are not located in the open country, as the rule for Benedictines, but are placed in the interior of a city on a limited building site. Fig. 20 [25] brings us the ground plan of the destroyed Augustine Monastery in Nuremberg.

Note 25. From drawings prepared by von Essenwein at the opportunity of the removal of certain parts on the basis of plans to be found in the city building department.

At x, y and z were erected three adjacent houses; at w stood a building belonging to the monastery, having the form of a p private house externally, actually the dwelling of the abbot. Through this led on one side the way to the portal a of the monastery, while at a' existed a second access to the vestibule of the monastery; at b was the chapter hall, and at c the refectory. Over the wing of the building containing the chapter hall was found in the second story a great hall, the dormitory of the monastery, in the third story being a larger one, probably the dormitory of the novices; the remaining rooms in the various stories served for the other needs.

34. Mendicant Orders; Franciscans and Dominicans.

If the last example was adapted in some degree in the distribution of the rooms to the requirements of the Benedictine and Cistercian monasteries, then in the later middle ages appeared new orders, which with a thoroughly different conception of t the monastic life required different architectural plans for their purposes. Before all to be mentioned here are the mendicant Orders of Franciscans and Dominicans, that originated i in the 13 th century. Besides the ancient vows of chastity, poverty and obedience, their principle is not the flight from the world for devotion to consecrated meditation, but the exercise of pious activity in the world. Thereby they lessened the difficulties against which the maintenance of a severe discipline in the monasteries of the earlier Orders was so frequ-

frequently wrecked. They devoted themselves especially to the
care of souls and to public preaching, the defense of church
teachings against newly arising ideas, and thereby acquired a
leading part in the spiritual battles of the time. The Domin-
icans in particular exercised for this purpose an animated sci-
entific activity. In the establishments for instruction erect-
ed have frequently been placed the beginnings for the develop-
ment of the universities, as on the other hand as Domini canes
(dogs of the Lord), as they liked to call themselves, were the
chief promoters of the Inquisition. Both Orders, but especial-
ly the Franciscans were devoted to popular activity, entered
37 further into the chasm, where the gradually increasing diffic-
ulty of social conditions did not suffice in regard to the st-
ill slightly developed power of the citizens, when they assis-
ted the poor and the sick, sought them, consoled and cared for
them. By the severity of their change of life, as well as by
their pastoral influence on important persons, they formed a
counterpoise against the tendency toward extravagance and lux-
ury, increasing in all classes. Just this high social import-
ance very rapidly produced for the mendicant Orders great fav-
or in all ranks. Everywhere men sought to engage for themsel-
ves these modest helpers; princes, states and wealthy citizens
competed in founding such monasteries, and scarcely fifty years
after the foundation of the Orders, they had extended through-
out all western Europe in hundreds of settlements.

Such incomparable activity carried out externally, naturally
required an entirely different plan of rooms. There were need-
ed rooms for preaching and for business of every kind, for in-
struction, and for administration of the many-sided benevolent
undertakings. Thus in the ground story of this monastery, be-
sides the rooms intended for the monks themselves in chapter
hall, refectory, library, etc., there regularly occurred a se-
ries of larger halls, that after the mediaeval custom could be
utilized at the same time for the dispatch of the most differ-
ent affairs. On the other hand in these monasteries always lo-
cated in cities and without landed estates, there were lacking
all arrangements and rooms, that in the older Orders were int-
ended for the practice of agriculture and the storage of crops.

35. Franciscan Monastery at Danzig.

Fig. 21 gives the ground plan of the Franciscan Monastery c connected with the Church of the Trinity at Danzig. [26]

Note 26. From plans by the courtesy of the administration of the Museum there, while the Church of the Trinity is added from a drawing by Building Inspector Heise in Danzig.

The main portal of the monastery is at a; yet at b and e are also entrances, from which one passes into a vestibule contain-
38 ing a stairway to the upper story. Grand and in the richest development are arranged the vaults of all rooms of the ground story. They commence directly at the floor, but rise to a considerable height at the crowns. As may be seen from the cross section of one wing (Fig. 22), on the contrary the second story with the dormitories and other rooms has but a low height. The very large rooms are there subdivided by wooden partitions, so that in the common dormitories a cell can be separated for each inmate.

36. Carthusian Order.

This is an arrangement, that was also introduced after the beginning of the 16 th century into the monasteries of the older Orders, when by papal permission the great dormitories were divided into separate cells, one of which was assigned to each one of the less numerous monastery brothers as a living and sleeping room. When men therein departed from the original rule of S. Benedict, they adapted themselves to the generally changed conditions of the time and of living, to which the earlier strict binding of the individual to the activity of t the brotherhood no longer corresponded. Thereby was only created at a relatively late date the possibility, that the individual could develop according to his own personality in quiet meditation and could bury himself in independent spiritual work; only afterwards could again be generally fulfilled the conception of the sacred thoughts of a pious monk living in a quiet cell. Yet also this idea, that substantially recurs tc t the ancient oriental hermit life, already at a comparatively early time found its embodiment, at least in the Carthusian Order founded at the end of the 11 th century. The strictest seclusion from the world, with other increased severities added

to the Benedictine rule were carried so far by them, that the brothers also avoided the common life together. Only on Saturdays did they gather for confession and the dispatch of common affairs; otherwise they lived apart from each other in separate cells for pious meditation and intellectual labor, that the Order especially pricticed in addition to field labor. But on accidentally meeting or during occasional common activity unbroken silence was made a strong command. Such a mode of 1 life closely adhered to oriental models and led to monastery plans, that may be termed monumental conceptions of the ancient oriental idea of a monastery, that of a court surrounded by cells.

37 Fig. 23 gives the ground plan of the Carthusian Monastery at Clermont,[27] certainly somewhat rebuilt in 1676, that Viollet-le-Duc published after an old plan.

Note 27. From Viollet-le-Duc. Vol. 1. p. 307 et seq.

It lies tolerably distant from the city and therefore is furnished with towers of defense F on its enclosing wall. The western portion before the church A B, divided into two rooms, contains a farm court, in which the stables are placed at N, the granary at Q, a dovecot at H, and a bake-oven at T. At O is the entrance; at P are dwellings for guests and at C is the house of the prior, at a the cell of the sub-prior, at E the chapter hall, at F the entrance to the cloister, at S is a smaller and at D the great court surrounded by the cloisters. Adjoining the cloister are the cells of the monks, each with a little garden; at X lies the refectory, wherein the monks indeed gathered only at definite intervals, and at V is the kitchen. Also should be mentioned the prison at Z.

38. Carthusian Monastery at Nuremberg.

Very closely allead thereto is the Carthusian Monastery in Nuremberg, represented in ground plan on the adjacent Plate. When it was founded in 2386, it lay outside the city on a large domain enclosed by a wall. The building itself was arranged for 20 brothers besides the prior and sub-prior, and is smaller than the Carthusian Monastery at Clermont, although the latter was only inteneed for 18 brothers.

Likewise here in Nuremberg was the western portion a farm c

court, into which one entered at x. At a was the dwelling of the prior, at b that of the sub-prior with a small garden. The entrance to the clausure was found at z; around the clausure were 17 cells c, three of them being in a second row on the south side. At d was the chapter hall, at e the monastery church, at g the kitchen; h are two fountains, i the stables, K and I being granaries. In the upper story over i, k and l were indeed the dwellings for guests, the hospital, library etc.; m was a mortuary chapel; r the great garden, access to which led from the cloister. For the separate cells the inner passage was omitted, that in Clermont extended along each cell on the cloister; likewise was wanting in Nuremberg the covered passage leading to the privy. But also in Nuremberg, as in C Clermont, each monk had three small rooms in his cell, as well as an attic room reached by a stairway. As well known, the Carthusian Monastery in Nuremberg still remains, though substantially changed. When the German National Museum occupied it, the greater portion lay in ruins; yet the entire ground plan was restored from these with the aid of some plans from the last century.

39. Foundations for Canons etc.

Similar to the previously described monasteries are also arranged the buildings for canons, the so-called canonries.There naturally disappears from them, just as for the mendicant Orders, the structures intended for agriculture and for workshops. And there the masters of the foundation lived just as little apart from the world, as did the later mendicant orders, since like these, they further required all sorts of rooms for purposes of administration, for schools etc.; thus their foundation buildings also exhibit a similar and freer development of the ground plan, than the monasteries of the former. In any case there also remains with them as a rule the arrangement of connected buildings extending around a cloister.

40. Buildings of the Orders of Knighthood.

A very particular position was occupied, on the other hand, in the architecture of the Orders by the settlements of the Orders of Knights, so far as located in the country of unbelievers, they served at the same time as the residence of the so-

society of knightly monks as well as a place of arms. Such a peculiar expression, that retained a connection with the living conditions of the actual monastery, in a remarkable way is to be observed less in the great fortress structures, which the Orders of knights themselves erected in the Holy Land. The c conditions of the great wars pursued there may have caused, t that the knights appeared as leaders of great armies, and arranged their fortresses as greater garrisons, not living as monks. In any case the rooms intended for the Order in these buildings, which were previously treated in the preceding Heft
40 of this "Handbook", played no part essentially beyond that of
41 buildings intended for defense and for receiving numerous mounted men. In the smaller proportions, among those of the Teutonic Order of Knights, and that most nearly similar thereto in the Slavic East for the extension of Christianity, competing with it for the blessings of a higher civilization, on the contrary an appropriate expression was found for the peculiar fusion of monastic and military life.

41. Castle of the Brothers of the Sword at Riga.

We reproduce on the adjacent Plate the Castle, that the Order of the Brothers of the Sword erected after the year 1330 at Riga as the seat of the master.[28]

Note 28. From Neumann, E. Das mittelalterliche Riga. Berlin. 1892.

Within a citadel rises the massive rectangular mass of the castle prober, piled up in three vaulted stories and extending around a court about 72.2 ft. square, accompanied by porticos. For warlike purposes the chapel is entirely included within t the structure; it lies in the second story, occupying in the plainest rectangular form the southern angle of the building, and it is accessible from the gallery of the court, like all other rooms as well. A strong flanking tower affords at the smae place space for the sacristy and protects it externally. At the southeast adjoins the chapter hall, considerably longer than in other monasteries, since it not only served for solemn councils as there, but at least in times of peace -- served f for permanent occupancy by the knights. Then succeeds the dormitory, that has somewhat less area, beyond being a small room,

perhaps assigned to the commander. Three apartments for the grand master terminate in the north wing and its conner tower the series of actual living rooms. There follow in the same wing some small rooms, that perhaps might serve as guest rooms. They are reduced and intersected by the two chimney flues of the kitches in the ground story. A passage between them leads to the tower, placed next the moat of the castle. This is a regularly recurring detached tower at the castles of the Order, here of wood, but mostly built of stone with some architectural decoration, and intended to place the privy of the castle at the greatest possible distance from the inmates. Behind o one of the kitchen flues is a small punishment cell for penitent members of the convent. Finally at the western angle of the building lies the assembly hall of the convent, the refectory of the knights, and the chapel. All rooms of this second story are covered by vaults, in part of rich design, carried to the considerable height of 27.9 ft., and in great part are lighted by beautiful windows with tracery. In the ground story is found the castle gate beneath the commander's room; beside it are rooms for the gateway guard and the porter. Otherwise this likewise vaulted story contained the two kitchens f for the grand master and for the convent of knights, together with shelter for the inferior garrison and the wagons for baggage and arms. A likewise considerable cellar story beneath the east and west wings received provisions of all kinds, and also cattle and horses in time of danger. The attic of the vast building indeed served particularly for defense. For passage between the different stories several narrow stairways w were arranged in the thickness of the wall; we are enabled to add external stairs in the galleries around the court according to other existing examples.

42. Monastery Rooms.

If we have in the prededing reviewed the development in which the general design of mediaeval buildings for the Orders have taken form, then in addition thereto are certain requirements to be discussed, to which were subject the plan and treatment of certain rooms in the monasteries, requirements that do not apply to the other domain of secular architecture.

43. Cloister.

Most intimately connected first appears the plan of the cloister, as it results in rectangular form as an aisle around an uncoverd court. And yet there appear in it all sorts of variations, that afford evidence of how with unrestricted sense of beauty the ancient masters understood how to adapt themselves to existing conditions. Besides the generally prevailing nearly square form of 65.6 to 82.0 ft. internal width, these formed very long extended courts, as for example, the cloister of the 12 th century at the Cathedral in Hildesheim, in the interior of which and in the midst of the graves of the canons rises the Gothic chapel of S. Anna. Likewise men were not shocked by irregular forms occasionally. Thus the cloister of Regensburg Cathedral is of trapezoidal form and is divided lengthwise by a wide transverse aisle; adjoining this passage is the early Romanesque chapel of All Saints, that formerly stood free in the interior, like the chapel of S. Anna at Hildesheim. Compound forms were also possessed by the now destroyed cloisters of S. Apostles and of S. Gereon in Cologne. In the former the semicircular end of the transverse aisle projected into the angle of the cloister, and therefore to the court was given then a cut-off form by two oblique systems of arches. At S. Gereon it was desired to leave the porch of the church visible, and therefore the aisle of the cloister was returned in rectangular shape at both sides of this porch.[29]

Note 29. See Boisseree, S. Benkmale der Baukunst vom XII b bis XIII Jahrhundert am Niederrhein. Munich. 1853.

Even entirely irregular ground forms with obliquely abutting or even bent wings have been occasionally developed into very charming and picturesque form, as for example, at the Cathedral of Freiberg in Saxony. And even if with a regular ground plan the effect is essentially based upon the quiet repetition of the same arcades, men loved to soften the rigidity of such designs by treating certain bays as entrance doorways, or more effectively, in that the upper stories of the four sides were of different forms, indeed only certain parts of the cloister aisle being built over. In combination with the higher masses of the church nave and of the transept gable, there thus resu-

results frequently from the strictly connected form of ground plan very picturesque effects.

But the basis for the treatment of the cloister in itself y yet always forms the uniform **repetition** of an architectural **system** strictly restricted within itself. The cloisters differ from the ground story porches of the citizens' houses in that, they are not freely open to passage like them. They are much rather invariably separated from the cloister garden by a solid parapet wall. Likewise from the upper galleries found in citizens' houses and princely palaces, they are distinguished by the fact, that their arched openings between the main piers are almost always filled by smaller divisions, an arrangement that gives to them the characteristic impression of enclosure and contemplative gathering. We find such richly graduated architecture already often in use, when from lack of means the vaulting is omitted,and men are satisfied by the arrangement of an open framework of the roof over the cloister aisle, which must have formed the rule in the **earliest time**. Thus in the convincing restoration by Schäfer of Jung S. Peter in Strasburg, which dates from about the middle of the 11 th century, and is indeed the lodest remaining in Germany, and particularly one of the earliest cloisters with artistic treatment. It exhibits the alternation of small columns by threes, beneath which extends the solid wall indispensable in every cloister, with a larger middle pier between the groups; at the middle of each side of the plan a wide round-arched doorway breaks the series of these rhythmically arranged openings. The columns support strongly projecting impost blocks for supporting the thick masonry arches, a form frequently employed for the like case, and for which we represent some richer solutions from the Monastery of S. Paul in Carinthia.

44. S. Maria im Capitol in Cologne.

Essentially more developed than the conception of the Strasburg cloister, reminding one of Early Christian models, is the treatment of the slightly later cloister of S. Maria im Capitol in Cologne, whose general arrangement and section are given in Figs. 26 and 27, the arcades being shown at larger scale in Figs. 28 and 29.[29]

As this forms the rule for the later structures, this is covered by vaults, indeed here being employed Roman cross vaults resting on light transverse arches. Corresponding to the separate divisions of the vaults are arranged square piers, that stand opposite thin pilasters on the walls. From these detached piers extend transverse arches at such distances as to produce square bays between them, that are covered by simple cross vaults without ribs. Between the piers of the external wall stand columns, that support on both sides projecting impost s stones; above the middle impost a corbel affords a greater projection, so that two larger arches could be arranged together with four smaller ones beneath them. Meanwhile not all wings of this aisle are alike in architecture. At other places stand only two columns with three arches, the middle one being wider than the two side openings between the two piers. The entire window architecture has been recently rebuilt, so that from i its character an accurate determination of the time in which the work originated is scarcely possible. We may believe, that it was erected not too long after the completion of the church at the middle of the 11 th century, and would therefore place it at the change from the 11 th to the 12 th century.

The form of cloister found here continued substantially determinative for the Romanesque cloisters of Germany; but in their enclosures were developed a great abundance of charming solutions by the alternating arrangement of the columns, by differently graduated heights of the openings, and by varied dimensions and treatment of the piers.

45. Puy-en-Velay.

An essentially different conception of architecture is shown by the cloister in Puy-en-Velay represented in Fig. 39 [30], which was formerly ascribed to the 10 th century, but which is rather to be placed at the close of the 12 th century, corresponding to the better determined sequence in time of the similar Italian buildings.

Note 30. From Viollet-le-Duc. Vol. 3. p. 415.

Likewise for it the arcade stands on a thick parapet wall 1.48 ft. high, not shown in our illustration. It exceptionally forms undivided openings on rich compound piers, whose col-

columns, as representatives of the so-called protonenaissance of this southern region, seek to imitate the antique Corinthian order. The rich ornamentation with inlaid patterns in stones of different colors is derived from a frequently occurring art tendency in the time mentioned and in that country.

46. Gothic Cloisters; Heiligenkreuz and Aix-la-Chapelle.

With the progressive development of all architecture into a more fluid treatment of forms, and in particular through the influence of Gothic conceptions of forms, the cloister system received a more animated shape. Greater gracefulness came to the supporting parts, greater delicacy in the membering, singular freshness in the ornamental work; but the general arrangement remained substantially the same. Thus the cloister at Heiligenkreuz near Vienna [31] differs only by the graceful subdivision and the slenderness, even thinness of the columns, f from the work of the 12 th century. Then the cloister of the Cathedral at Aix-la-Chapelle (Fig. 31 [32]) has yet essentially Romanesque general proportions; but the division arches of its external wall rest on slender undiminished column shafts with Gothic bud capitals; their form is pointed. Two great division arches rest on a double series of such small columns; for the small intermediate arches are set single columns, and both in the spandrels of the main arches as well as those of the smaller intermediate arches graceful quatrefoil openings are finely cut.

Note 31. See Heider, G. R., von Eitelberger & J. Hiesen. Mittelalterliche Kunstdenkmale des Oesterreichen Kaiserstaates. p. 48 and Pl. 4. Stuttgart. 1858.

Note 32. From Bock, F. Rheinlands Baudenkmale des Mittelalters. Cologne & Neuss.

47 47. Zwetl.

More resultful and severer in form was Gothic art employed in the cloister at Zwetl, even if here also some round arches have remained in the world of form. (Figs. 32, 33 [33]). As in
48 Aix-la-Chapelle the division arches rest according to their rank on single or double columns; on the other hand, only the spandrels of the main enclosing arches are there accented, each being perforated by a sexfoil within a circular enclosure. V

Very boldly graduated projections in the interior bear the vaults furnished with heavy ribs; relatively heavy buttresses externally support these. In contrast to the cheerful love of ornament of the preceding example, is here indeed emphasized purposely the expression of the earnest and severe, contrasting with which, the graceful and right boldly loaded little division columns in the middle supports had to form a sharp difference.

Note 33. From the publications of the Wiener Bauhütte.

79 48. Maulbronn.

The examples heretofore given all form open aisles, which were nowise intended to be enclosed by glazing. This entirely corresponds to the original idea of the cloister, that has never departed from this arrangement in southern countries. In the north the progressive refinement and effeminacy certainly bring with them, that at least in the wealthier cloisters men took thought to secure protection from weather by glazing the openings. One of the oldest designs of this kind is the southern wing of the cloister in Maulbronn, originating about 1225. It is characterized again by the peculiar combination of a very dry and massive general design with the gost graceful treatment of some parts, here the supports of the vaults. (Figs. 34 to 38 [34]).

Note 34. From Dohme, R. Geschichte der deautschen Baukunst. Berlin. 1885 - 1888. -- Paulus, E. Die Zisterzienser Abtei Maulbronn. Stuttgart. 1873 - 1879.

It has a width of 14.76 ft. with 16.4 ft. height of crown; the lengths of the separate divisions of the vaults are likewise 16.4 ft. The vaults are hexapartite; the rear wall of t the passage is entirel smooth below; the imposts of the vaults project from the walls on a graceful arrangement of consoles and columns; on the contrary on the window side are arranged strongly projecting wall piers with five small columns attached to each; only for the intermediate ribs is found the same arrangement as on the rear wall. In the halves of the vault formed by the intermediate ribs are slender, simple pointed windows, that are furnished with the usual shallow grooves for glazing. They include a strong wall pier between them. On t

the exterior they are further bordered by two small columns, that support a moulded pointed arch. As in Zwettl also here strong buttresses are arranged to correspond to the inner main arch, so that with the wall and the projection of the pier an abutment 7.55 ft. thick opposes the pointed arch of but 11.LE ft. clear span. Yet the impression here is also not heavy, and the airy poetry, which lends such peculiar charm to the works of the first half of the 13 th century, is fully and richly expressed here.

How greatly in that century the custom still varied in relation to glazing the cloisters, we see in the example just described, The adjacent western wing of the cloister at Maulbronn was arranged as an open passage a good generation later (Figs.
50 51 39 to 41 [35]). In all its forms of detail it is designed for
a milder and more delicate effect; of especial charm, just in comparison with its predecessor, is the combination of graceful and quite developed forms of tracery with the massy surface of the still imperforate spandrels. Since the master of the building showed himself in everything else fully acquainted with the rich forms of Gothic, we may well see in this returned opening of the windows a reference to a combined effect of this with the older works.

Note 35. From Eisenlohr, F. Mittelalterliche Baukunst im südwestlichen Deautschland und am Rhein. Heft. 1 - 5. Cistercienser Kloster Maulbronn. Carlsruhe. 1853 - 1857.

49. S. Jean des Vignes at Soissons.

In France, the native land of Gothic forms, men had naturally advanced farther in their use at the same time, but likewise wavered between open and glazed openings. Frequently an intermediate path was struck out there, when the upper openings in the tracery were glazed, but for the lower portion was retained the beautiful effect of the free and graceful small columns. We give in Fig. 42 [36] one of the richest cloisters of this kind from the Monastery of S. Jean des Vignes at Soissons. The custom of entirely enclosing the cloisters by glazing seems to have not occurred in France; on the contrary it became generally common in the 14 th century under the weather conditions of Germany.

Note 36. From Viollet-le-Duc. Vol. 3. p. 445.

50. Franciscan Monastery at Bozen.

However much the interior of such a passage gains in comfort, just as much does the arrangement of the windows lose in individuality. The architectural systems of such later cloisters scarcely differ in the forms of buttresses, windows and mouldings from the forms employed on chapels and other church buildings of small scale. Meanwhile among the later examples are found very beautiful works; particularly are there developed on them all the arts of the late Gothic vault forms in the richest measure. The cloister of the Franciscan Monastery at Bozen, which is given in ground plan, section and internal view in Figs. 43 to 45 [37], show how these very elevated acquisitions of the stonecutter's art combine with the permanently preferred in the South, the long open porticos into an entirely uniform general form.

Note 37. From drawings in Wiener Bauhütte.

There are but few indications, by which we can produce the extraordinary wealth of precious architectural creations according to the main stages of development, and which the middle ages have created in harmonious cloisters. And we can but merely refer to the treasure of details in perfected form, that just in these buildings devoted to thoughtful reflection, give expression to the rich thoughts of the mediaeval mind on bosses, corbels of vaults, capitals, lintels of doorways etc.

51. Fountain Houses; Unser lieben Frauen at Magdeburg.

We have previously stated, how men knew how to animate the severely restricted movement of the uniformly repeated bay of the cloister by alternating treatment of the elevated parts, and how many of such buildings were heightened in their charm, by not being completed at one time, but in instalments, thus reflecting the mode of thought and abilities of different generations, and then fused into a united harmony. In another way then the joy in the animation of strictly ordered architecture served in the arrangement of charming little fountain houses, that originated in the customs of the Benedictines and Cistercians, and are frequently found in the more important foundations. We have already seen such a monumental fountain

on the plan of the Monastery of Canterbury, while it is not p preserved at Fontanella. In the earliest time and in simpler conditions, men were satisfied with a detached fountain in the middle or in a corner of the cloister, for example, such as we find arranged in the court of the House of the Order in Riga. (See Plate adjoining page 41). One of the oldest fountain houses is preserved in the Premonstrant Monastery Unser Lieben Frauen at Magdeburg, and it forms a plain circular building with a spherical masonry roof, having on the three detached sides great niches, opening in the lower story by peculiar arcades. Fig. 46 [38] may afford a view with what boldness dry masses and graceful forms of details are contrasted here, and how precious views into the open cloister garden are here produced. The upper story received the archives or the library of the monastery, a combination frequently a favorite elsewhere.

Note 38. From my own photograph.

52. Zwettl and Maulbronn.

In the progressive development of architecture the form of the fountain house took a characteristic part. Instead of the heavy and picturesque kind there already occurred in the early Gothic fountain house at Zwettl (Figs. 47 and 48 [39]) the graceful animation of all surfaces and the rich grouping of bold systems of windows with columns. In their place then occurs fine perforated tracery with an ever increasing avoidance of solid surfaces. While this fills with graceful filigree the entire surfaces remaining between the supports required, it creates an ever closer connection between the cool interior of the fountain house, animated by the plashing of the fountain, and the garden with its rustling shrubs and fragrant flowers. (Fig. 49 [40]).

Note 39. From drawings in Wiener Bauhütte.

Note 40. From Paulus.

It is perhaps the finest impression of fanciful and comfortable purpose, to which mediaeval art was permitted to attain. For love of such dreamily beautiful effects, these windows were left unglazed as a rule, and the resulting discomfort in the winter was accepted in the bargain. More rarely the view into the cloister garden was abandoned, and the windows of the

fountain house were glazed. For the entirely changed effect produced thereby, the great nine-sided fountain house of the monastery of Heiligkreuz may serve as an example. (Figs. 50, 51 [41]). In it the window sill is already placed above the height of the eye, and the view through the graceful gablets of the arcade strongly shows the closed nature of the lower portion of the wall, so that the innate harmony of the interior a and the exterior is entirely excluded. The effect is therefore placed in the most graceful execution of the internal architecture and in the rich play of color of the artistic glazing.

Note 41. From drawings in Wiener Bauhütte.

Of the rooms that lie adjoining each other around the cl-
57 oister, the chapter hall takes the first place in order of rank. Here assembled the monastery brotherhood for all solemn affairs, for the reading of the Holy Scriptures, for common counsel on important internal and external affairs of the monastery, as well also for sitting in judgment on the misdeeds of individual members. Here punishment was awarded before the collected convent, and for all, even for the slightest transgressions, formal and humble apologies were made. In many cases the room was prepared for such gatherings by fixed stone seats extending along the walls; opposite the entrance was arranged an elevated seat for the abbot. Likewise the pulpit for the reading of the daily chapter from the Holy Scriptures was occasionally permanently constructed of stone, whereof at Ossegg in Bohemia has been preserved a beautiful example. As previously stated, the chapter hall was first gradually inserted in the plan of the monastery. There originally served for the same purpose the aisle of the cloister adjoining the church. Indeed in memory of this origin is the connection of the room with the cloister, and thereby with the free interior of the court in by far the most cases has been preserved. Almost always there opened toward it wide windows not arranged for glazing; even the entrance doorway was without any closure, so that the ideal unity of the interior was unbroken. Fig. 13 represents a view from the chapter hall at Maulbronn into the cloister and may explain this.

58 Corresponding to its high dignity, the chapter hall was alw-

always vaulted, if the means permitted, indeed mostly on a double series of inserted supports, thus being three-aisled, and first in later times on a single strong middle pier. As a peculiarity of the Cistercians is to be mentioned, that they always placed a small chapel with the altar of S. John in connection with their chapter halls.

54. Refectory.

In expensiveness of treatment the refectory stands next to the chapter hall. In the earlier time this room was also liked when covered by high and proud vaults; later with the increasing effeminacy, men preferred designs of a lower and more comfortable sort, that were provided for heightening the cheerful impression by wooden wainscoting and wooden ceilings, often ornamentally carved. See the representation of the refectory in the Carthusian Monastery at Nuremberg in Chapter 8.(Fig. 398). If both could be secured at the same time, then the high vaulted hall was used as a cool summer refectory, the other as a comfortable winter refectory.

In the larger monasteries the refectories, both those vaulted and those with wooden ceilings, are mostly arranged in two aisles with a middle row of supports; yet there are found, especially in the smaller monasteries, undivided dining halls of a single aisle. As examples of such single aisle plans is the hall covered by vaults of great span at Heilsbronn near Nuremberg, that on account of its form is often held to be a church room, and for designs with a wooden ceiling is the beautiful hall of the Benedictine Monastery at Stein on the Rhine. For festal and cheerful lighting by high and wide windows, care is generally taken; as a practical peculiarity appears frequently an architecturally treated desk for the brother, that had to read from the Holy Scriptures during the meal. Famous is the charming pulpit, that was erected for this purpose in the refectory of S. Martin des Champs in Paris b: Pierrs de Montereau; likewise the master's refectory at Maulbronn contains a beautiful gallery, accessible by a small winding stairway for the reader.

More modestly and mostly as a vaulted room of low proportions is the refectory of the laity treated in Cistercian monasteries.

Its location in that wing of the monastery next the farm court, thus to the outer world, brought with this, that besides its immediate destination, it was further used for all kinds of other purposes, for the first reception of foreign travelers, for business transactions of all kinds, and the like. Hence it also occasionally bore the name of the hall, which in the larger secular courts served for the same purposes, the great hall.

55. Dormitory.

The sleeping hall or dormitory was usually by far the largest room of the monastery. Already in the Monastery building of Desiderius at Montecassino (Art. 27), it attained a length of 200 ft. with a width of 24 ft. It regularly occupied the entire length of the eastern wing adjoining the choir in its upper story and was in direct communication with the church by a stairway; further from it a second stairway usually led down to the ground story of the cloister. So long as in the sense of the ancient Benedictine rule it was utilized as an undivided room, in case of sufficient means it was sometimes vaulted in two aisles, or sometimes in three. These vast halls attain in Eberbach, Altenberg, etc. dimensions of 39.4 × 164.1 ft. to 42.7 × 229.7 ft. or even more. They express in the grandest and most solemn way by the long uniform series of beautifully curved vaults and powerfully treated supports, the idea of the common following of Christ, and the power of the idea of the Order, derived from the equality of all brothers. In later, more practical, and at the same time more effeminate times, these mighty halls indeed became less pleasant. Indeed after the prototype of the mendicant Orders, who mostly used numeroou separate cells as sleeping rooms in the different wings of the upper story, the older Orders after the beginning of the 16 th century dropped the idea of a common sleeping room. Thus many an old hall was then simply divided by the erection of thin partitions, destroying its internal effect. But besides this, at the same time a peculiar form was developed for the new arrangement, easily recognized from the exterior. For example in Bebenhausen and also in the Dominican Monastery at Brunswick with the entire rebuilding of those parts, the low cells were arranged along both sides of a high passage extend-

extending high into the attic, and this central passage was lighted by great tracery windows cut in the gable.

56. Warmed Room.

With all the expenditure in the treatment of the interior and skilful development in details, all the rooms so far discussed were still without an arrangement, which we ourselves cannot dispense with in the most modest conditions; there was lacking in all any arrangement for heating. That throws a clear light upon the custom of living entirely different from our own, of these monastic societies of the late middle ages, chiefly derived from the more prominent classes and eminent in high life. All need of warming in the cold winter period was at best satisfied, though not everywhere, by the arrangement of a warmed room or chamber, a designation that by later times, far removed from an understanding of monastic life, was indeed transformed into "wormwood chamber", and was connected with fanciful descriptions of the customs of the old monastery brothers. It was often supplied by a kind of air heating, that will be described in another place, and then is raised about a half story above the ground story, as for example in Maulbronn. In other cases it was heated by charcoal braziers; at 1 least there are for me indications, that stoves or fireplaces were unknown in such rooms as existed. That they were generally visited for only a time and for aid by those needing warmth, is apparent from the small size of the room, which in Maulbronn, for example, has an area of only about 430.6 sq. ft. against about 1076.4 sq. ft. for the brothers' room.

Chapter 2. Courts of Princes and Nobles.

Palace and Master's Residence.

57. Basal Conditions of the early Middle Ages.

We have already seen, how by Charlemagne's mighty rule so m much enrichment for existence was won for the North, but since these acquisitions were restricted to the greater palaces and royal courts, the national style of architecture was so far l left unchanged, that even in the royal farmsteads of the smaller size, we cannot recognize its influences. The succeeding periods were not adapted to allow these impulses in architectural affairs to become deeper. Of the confusion and terrors of this dark century, we can hardly form a conception. Constant quarrels between the great persons consumed the powers of the country; foreign enemies seeking booty broke in from all sides on the unfortunate inhabitants. As far as Paris, indeed even to Tours the Normans passed up the stream scorching and burning. Across the Lake of Constance and the Rhine to Gaul and in the south to middle Italy wandered Hungarian and Slavic robber hordes devastating everything. And on the coasts the inhabitants of the coasts around the Mediterranean Sea desolated even ancient famous harbor cities; the inhabitants sought refuge from the sacking by Saracenic sea robbers farther within the country or on the tops of steep mountains. This was not a time in which the hothouse plants of the Carlovingian court art could take root and could further develop themselves in the people.

Only in the change of the social stratification, which then occurred, was the foundation laid for new forms of progressive art. The possession of an independent farmstead had been at all times the mark and the pride of the freeman, and under the protection of national laws, had also sufficed to assure to its possessor an independent existence for himself and his dependants. Now the situation of this free people under the supremacy of the great and general insecurity became ever more difficult. In ever increasing numbers they gave up their freedom as the price of more powerful protection, when they transferred their farmstead to one more powerful for its possession, and preferably to the Church, in order to receive it again by payment of quit-rent. Thereby they renounced the preference

belonging to them, to independently appear for their right before the court of their national comrades, but rather subjected themselves to the court tribunal made independent and patriarchal for his tenants by the lord. Thus vanished the status of the freeman, and there was formed as its last remnant gradually an entirely new, but closely restricted state of powerful land-owners, from which later proceeded the families of the princes, counts, and of the other high nobility.

Just as little as free agriculture could trade and traffic develop any further; likewise in their situation must rather appear deterioriation than improvement. But therewith also appeared the remains of the city inhabitants in a further decadence instead of in a richer development. Thus first the rural farmstead in its plainest form corresponding to pure necessity remained the residence and the centre of the civilization of the greater number of people. When beneath the powerful sceptre of the Saxon emperors, at least in Germany, safe conditions were again created, it first availed and also long afterwards to heal the wounds, that the wild and lawless period had made in the wide circles of the people. It had still lasted in other countries, until art also began to ennoble the well-being of the people. First the newly beginning development was supported by the previously mentioned landed nobles, who might now be of a spiritual or of a secular nature.

58. Buildings of the Saxon emperors; Merseburg and Siptenfeld.

The nature of the architecture of the spiritual nobles has been described in the preceding Chapter on the monasteries and foundations. We now turn to the residence architecture of the important class, that had its climax in the emperor, since they themselves chose from the mightiest of their class itself the worthiest for the imperial crown. In these circles appear the views once expressed by Charlemagne on what pertained to a dignified representation of imperial power and highnesss, also held in the following period and forming the basis of imperial architecture. In the most disturbed times of that dark century, men must certainly be satisfied to find safety from enemies and shelter behind earthen walls and wooden buildings.

But scarcely were the borders assured in any manner against a hostile devastation, than the great model enticed to competition. Already Henry I according to old tradition built in Merseburg a stone palace with an upper festal hall, in which were represented in mural paintings the events of the famous Hungarian battle. Likewise the year 1002 is to us traditional for the existence of a palace with upper story in the Palatinate at Pöhlde, beside which rose also wooden dwellings. Of the buildings of the Saxon emperors, there remain to us neither considerable remains nor clear descriptions, yet the results of recent excavations always permit us to form a certain conception of the plans of such royal courts. Many plans, for example, Bodfield in the Harz Mountains, appear to have been quite unimportant and small, without our therefore having the right to doubt, that as a hunting box, they may have formed a favorite stopping place for a mighty monarch. For nothing would be more incorrect, than to transfer the opinion of modern comfort and the present court life to those far more original times. And also today the mightiest of the earth gladly return to relatively plain forest seclusion, and there occasionally complete important governmental affairs. The remains found in Bodfield in their entire conception certainyl permit the possibility in a high degree, that it was first built as a little fortified house on the site of the imperial court. Likewise the so-called "Hohe Schwarm" (high crowd) near Saalfeld is entirely uncertain in its age and probably was later restored. An entirely different representation of domestic life in the early middle ages than that of these remains is given by the following plan, better determined in its date. By excavations in the year 1888 in the Harz Mountains the foundation walls of an ancient establishment were brought to light, that are represented as the remains of an imperial court of Sippenvelt (near Siptenvelde), that was first mentioned in the year 940 in a document of Otto I. It is a plan of irregular form, originally only enclosed by a wall, later by a wall and also a ditch.

Nearly the middle of the court area is occupied by the main building A (Fig. 52 [42]). The form of its foundations can be so laid out, that in the lower portion in the illustration are

two or three smaller rooms, the upper story containing a great hall, subdivided by supports set on the cross walls. In the upper story must we then again assume a great festal hall, occupying the entire extent of the house. The buildings B and C served as stable and shed; on account of its form and location accurately east and west, D certainly formed the court chapel. In E, F and G may we see buildings for household purposes (kitchen, bakery, and bathroom) and for retainers; I and K are explained as dog kennels, and L as the mill. If we conceive, that at least besides the buildings placed on stone foundations, there must have been a number of slight wooden structures for servants and other subordinate purposes, there results a plan, that seems to have the greatest similarity to the previously mentioned Carlovingian principal court Asnapio. (Art. 16).

Note 42. From Zentralb. d. Bauwesen. 1892. p. 15.

59. Gray House at Winkel.

A ruin of similar date of origin perhaps remains to us in the so-called Graues Haus at Winkel in the Rheingau (Fig. 53[43]). It is an important dwelling, designated by ancient tradition as the House of the learned Archbishop and courties Hrabanus Maurus, who died in the year 849 at Winkel, probably erected or at least rebuilt certainly 200 years later with the use of some ancient ornamental pieces. We may think of it in similar surroundings, as those shown us by the royal court in Siptenfelde. Of the entire plan indeed there has come down to us only the dwelling, and morresponding to the more modest rank of the owner, this is more simply arranged than the imperial palace there. But on account of its good preservation, as a valuable supplement, it may well illustrate the preceding example.

Note 43. From Luthmer, F. Die Bau- und Kunstdenkmäler des Rheingaues. f. 222. Frankfort O. M.

The ground plan forms a simple rectangle of about 36.0 × 42.7 ft., that was extended at one end about 13 ft. by a small and visibly later addition. This extension is one story with a s shed roof leaning against the main building, and it contained the kitchen and a small side room, that corresponding to most ancient custom, must have been placed in a separate house.

Furthermore the stairway to the doorway found in the gable of the upper story must have ascended there. Thus it originally lay in the open air and produced no connection between the two stories of the house. The entrance doorway of this addition shows a very archaic and simple gable ornament. The main building is divided in the lower story by a longitudinal wall into two rooms, sparingly lighted by small windows, and accessible by a large round-arched doorway, in its arch alternating stones of different colors in a regular arrangement. In the upper story there lies first an attic of half height over the kitchen, from which the before mentioned doorway leads into the main building. Judging from the now walled up group of windows of the south wall, this must originally have formed a single great hall; for this group, increased to four windows, occupies exactly the middle of the longer wall. Now in this, as the result of a rebuilding, is a partition wall extending from the eastern gable wall. One may assume that adjoining it was a cross wall parallel to the gable wall; for we obtain as the actual dwelling of the owner a hall about 19.7 × 31.2 ft. with two small rooms lying behind it and a small house chapel accessible by the doorway A. The largeroof these rooms is shown to be heated by the remains of a fireplace recess. probably a remnant of this fireplace is the piece of moulding B found in the house, of late Romanesque form. Both rooms exhibit the ornamental arrangement of the small window groups in alternating and carefully developed form. The graceful small columns at the window F possess a completely developed cushion capital, that in opposition to the Byzantine-Carlovingian primitive type is furnished with an abacus, thereby forming a support for the date previously given. Since the section M-N-O-P for this portion of the building also shows another upper series of windows, then over these smaller rooms might have been a story of sleeping rooms. In contrast to the small windows of this living r room, that indeed could be closed by shutters, the southern s side of the great hall still exhibits the remains of a row of wide and larger arched windows, that admitted abundantly light and air to this room, and gave it the characteristics of a solar. We might well assume, that its supports were composed of graceful columns. Their arches consist of alternate courses

of small ashlars and Roman bricks, such as are usually found in the 11 th century on the middle Rhine; the still remaining impost has an expressly Romanesque form. As further ornament served at the ends of the eaves of the roof projecting stone corbels in the form of bears' heads, shown in our illustration C. They may be regarded as the side endings of a projection of the roof serving as the main cornice.[44]

Note 44. There should also be mentioned the work, which appeared during the printing of our book. Eichholz, P. Das älteste deutsche Wohnhaus (Strasburg. 1907). The author regards the rear portion of the building about 28.0 ft. wide as the original building of Hrabanus Maurus, and the front portion as an extension, that was likewise executed in the Carlovingian period. -- The condition of the house does not permit an absolute decision; for many reasons, a portion of which are derived from our description of the building above, we adhere to the given date.

In this connection of a separate lower story with the arrangement of a great hall, as well as the smaller living rooms in the upper story, and further in the arrangement of the external stairs, the whole shows in a simple but very characteristic manner, what was then required for the dwelling of an important court. Here the hall for the festal reception and entertainment of the guests and retainers was made prominent above the other buildings by the lower story, thereby producing the impression of importance. Care for the comfort of living was taken in the subordinate rooms, so far as this existed in the sense of that time.

60. Hall of William the Conqueror on the Bayeux Tapestry.

That for the views of that time the palace with the "hall", as the most important part of such a royal court, is apparent. Then to the simple man, who before and afterwards occupied his plain hut, first the several stories of such a palace, together with its stone construction and its ornamental columns, the construction of freely spanning arches etc., must have appeared as truly wonderful works. Thus were the palace and especially the existing festal hall in its upper story were chosen in picturial representation as representative of the royal household. The famous Tapestry of Bayeux, an extensive embroid-

embroidery from the end of the 11 th century, on which the deeds of William the Conqueror are represented, gives us such a picture. (Fig5 54 [45]). Indeed the forms of the building are so carelessly treated with the highest naivety, that even the decision must be difficult, whether a stone or wooden structure be meant (only the innate probability is in favor of the latter); the railing of the upper story is entirely lacking, so that the lower half of the carousing retainers would already extend into the drawing of the lower story, if they were to be drawn; likewise the representation of the walls and of the supports of the solar is substantially avoided, in order that the artist may be better able to represent the essential facts, the joyful carousing of the company. Nevertheless we can also determine here the plan of the independent lower story and the uncovered stairway arranged at one end as characteristic ideas.[46]

Note 45. From Kulturhistorisches Bilderatlas. II. Mittelalter. By A von Essenwein. Pl. 26. Leipzig. 1883.

Note 46. An undeniable similarity to the given representation is shown by the house of the Abbot, "aula nova" on the ancient plan of the Monastery of Canterbury (See Plate next page 35). According to a very expensive conjecture, the famous Carlovingian building in the Monastery of Lorsch was not a gateway portico, but represents an important dwelling (See Schweisthal, M. La halle germanique et ses transformations. p. 9. Buxelles. 1907). It actually resembles in a high degree in its lower arched hall and the upper enclosed hall story the previously mentioned examples.

61. Romanesque Palaces in Germany.

In this emphasizing of the festal hall is reflected in the clearest manner the after effect of ancient German customs. As every more powerful head of a race or of a settlement had then built his prominent hall, in order to gather about himself therein his warlike followers for festal society and for counsel, then each one of the great landed nobles, and first of all each of the princes, required such a room in his residence. For by the changed classification of the mass of the people, and especially by the increase of the serfs, not only the prince of the country, the public officials, the court or

the royal messenger, but each large proprietor, every church dignitary, had to transact affairs of justice, jurisdiction over the militia, and official activities of all kinds. Besides it availed for regulating the conditions of the "family", i.e. in the ancient Roman sense the community of all persons economically and legally dependent on the master by orders and by common counsel, also to create the solemn background for t the payment of rents and for the symbolical homaging for legacies. Likewise it was utilized for celebrating festivals, that by gathering together the splendid knights was suited to carry afar the fame of wealth and power.[47] Thus arose everywhere in the German provinces, with the return of better times, palaces of the emperor, of princes and masters; relatively numerous do they remain to us, especially from the period at the end of the 12 and the beginning of the 13 th centuries, when the strength of the German people, aroused by the impressions of the crusades, first strove to take a more artistic and splendid part. Therein is it characteristic of the power of the German rulers, fast rooted in their own land and based on the usual command of faithfulness, that such a palace architecture retains throughout the expression of cheerful frankness, not hardened by any sort of arrangements for defense, showing mistrustful fear.

Note 47. The word "Curia", which was employed for secular as well as for spiritual, for large as well as for small courts, according to its origin, denotes, that the curia, thus the open court and the hall adjoining it, the palace, also joined to the ancient curia, to the assembly room in which the curials met in order to observe sacred customs, to speak of common affairs, and to hold solemn feasts. The expression "malbergium", common in the Merovingian and Carlovingian periods (the room containing the "mal", i.e., the public court of justice), and which was still usual in France in the 12 th century, and was Frenchified as "mauberge,", shows that these halls or buildings were not built in the first place as festal and banquet halls, but for such earnest and solemn labors, such as served for the great transactions of the emperor's government, for courts of justice, for investitures, for the reception of envoys, etc.,

And that indeed at first as in ancient Rome in the curias, only beside the courts solemn meals were held therein, where the monarch was surrounded by his court, and under some circumstances was attended by his wife and the women, but did not enjoy himself as a private man, but in accordance with his dignity fulfilled his duties publicly (von Essenwein).

The German rulers did not dwell as monarchs in foreign lands; they did not need to retire into gloomy towers as dwellings ((donjons), like the Norman conquerors. For them in ordinary times the attachment of their retainers formed a better protection than dwelling in massive fortresses. These conditions have found a poetical expression in the beautiful tale of the Thuringian landgrave, who obligated himself to extend a strong wall about the Wartburg within three days. And when the time had elapsed, he showed his palace surrounded by a closed chain of his armed vassals, that he had speedily ordered. Indeed we are told by history of wild combats of warlike parties, that according to the very animated representations of contemporary writers, at some times seemed to seize the entire country and to devastate it without recourse. But in this is much mere a appearance, that comes partly from the rhetorically exaggerated manner of writing of the monkish chronicles, partly from the unconscious transfer of modern conditions in war, such as affect the classified mass of the people to the deepest depths. Under the much looser conditions and obstructed by the defective means of commerce of those times, the struggles of the individual great man for power, that substantially fills the history of the 12 th century, indeed could never exert such vigorous influence on the life of the people. We may very well so represent to ourselves the actual conditions, that the storm of such internal contests, supported by not very numerous knightly followers, sometimes here and sometimes there, blustering through the land like a storm, indeed destroyed so much in its way, but also passed away as rapidly as it came. And everywheee appeared in the frequently intervening times the field of quickly springing flowers, so that the devastations could not have gone too deeply. Therefore the German emperor as a rule was satisfied with relatively few fortifications, that

extended around the widely spread plan of the court. Within this enclosing wall, under the protection of the "fortress peace" enforced by heavy punishments, there prevailed free traffic and open confidence of the inhabitants toward each other. Thus the hall building of the important court, for which the designation of "palace" was generally adopted, in germany regularly dispensed with fortifications, but opened as freely as possible toward the court. It was not rarely designated by the word "aula" or court, thereby denoting that in reality it was still regarded as a part of the open court, on which the followers after the ancient German custom gathered under the open sky. Common just there to the older plans is the very plain form of a two-story rectangular structure, that contained in the generally enclosed lower story rooms of subordinate character, such as storerooms or shelters for the retainers, but in the upper story was entirely occupied by the great hall, whose walls were pierced by broad groups of windows toward the court. [48]

Note 48. At this time, the best collection of drawings of these buildings is given by the Jubilee Part 26 of Denkmäler der Baukunst, published by the students of the Royal Technische Hochschule in Berlin. Abt. 1. A comprehensive description is also given by Simon, K. Studien zum romanischem Wohnbau in Deutschland. Strasburg. 1902.

62. Castle Dankwarderode at Brunswick.

A very good representation of such a plan, as it was erected by one of the important princes, is given by the Brunswick Castle Dankwarderode. It is at the same time one of the oldest, and by the thorough work of Winter [49] has been entirely divested of the many later alterations, and was completed in the r representation on the basis of the excavated remains of the foundations, and thus made more intelligible in connections than many others. In the preceding Heft of this "Handbuch"it was shown by the plan of the site,[50] as it was originally enclosed by several branches of the little Ocker stream, standon a slight elevation together with the Cathedral. On the adjacent Plate is given a representation in Bird's eye perspective,[51] that makes clear the location of the separate buildings

beside each other, the fortifications by a wall with towers, and an instructive view of the then commencing city settlement is afforded. Beside the cathedral and its cloister designed for the dwelling of the foundation canons, the building appears first as dominating the group. Protected by the broad arm of the Ocker flowing past, without special means of defense and with the castle chapel, it forms a portion of the enclosure of the castle. The actual living rooms, partly placed in the defensive towers, adjoin it at the side; smaller and less conspicuous structures for servants and for agriculture are to be conceived as scattered in the court after the ancient custom. Fig. 55 [51] gives the plan of the group of the ducal living rooms.

Note 49. See Winter, L. Die Burg Dankwarderode zu Braunschweig. Results of investigations in architectural history made at the order of the City Magistrates. Brunswick. 1883.

Note 50. First edition; Art. 56. p. 59.

Note 51. From Winter.

The hall building or Palace P rises in two stories with the considerable dimensions of about 49.2 × 137.8 ft. It contains in each story a great hall covered by beams, whose ceilings a are supported by the central row of posts.

In the lower story are square piers decorated by inserted small angle columns, and conected by bold arches of cut stone, which receive the ceiling; in the upper story we may assume a lighter series of columns and a wooden girder. On the exterior the upper hall on both long piers is distinguished by a rich arrangement of triple columnar arcades with great round-arched window openings, that furthermore possess no arrangement for closure, while the lower story with plain and small windows is treated in subordinate form. A double portico lies before both halls on the court side; to that of the upper story leads a flight of steps, concerning whose form doubts may indeed exist. By covered passages are connected the living rooms of t the castle, but at the same time are also to be reached from the court by a separate flight of steps. They are clearly subdivided into two but loosely connected parts; namely the dwelling of the ruler himself and of his retainers, and that of t

the women. The first comprises in the principal story but few rooms of considerable dimensions; the tower room D and the main living room G, from which one may overlook the entire court, as from the solar of Charlemagne in Aix-la-Chapelle. Some small chambers and anterooms adjoin and partially enclose the very important three-aisled castle chapel.H. Yet farther south lies the dwelling of the women, again connected only by a covered passage. In the projecting tower C is found the chief apartment for the more intimate family life, "the private room of the women;" the smaller rooms at Q were used as sleeping rooms, as well as living and work rooms of the female servants. The lower story of this part of the building also contains all sorts of chambers with furniture and working equipment for the women. It was connected with the upper story by a stairway in the wall, so that it could be reached without passing through other parts of the palace from the court.

The entire structure is very instructive in the clear separation of the various parts; feast house, master's dwelling and women's dwelling, while it plainly shows, that the ancient custom of building one's own house for all purposes had in nowise died out. That the number of living rooms, considered according to modern views, appears small, it is then first to be considered, that in that time the social separation between ruler and retainers was much less than now. The descriptions of the poets in "Tristan", in "Parsifal" and in other knightly poems permit the relation between the two -- naturally entirely aside from the different conditions of civilization -- to appear similar in the community of living, about as exists today between a head farmer and his laborers. Thereby a multitude of separate rooms became unnecessary, which today seem indispensable under simpler conditions, and it came to this, that on the one hand festal gatherings could be carried on in the great hall entirely separate from living, and further that shelter was provided for the lower class of retainers in the lower story of the hall and in the subordinate structures of the court.

83. House of the Emperor at Goslar.

The most important in area and in location as in artistic

treatment most expressive development, the design of such hall buildings has received in the emperor's House at Goslar. Men have long believed that they beheld in the building long preserved to us the Palace of the Emperor Henry III (1089 - 1056), built for himself in Goslar, thus placing a special historical value on the great structure as one of the oldest of its kind. Later investigation indeed has not been able to verify this. That Henry III indeed erected a hall building on this site is at best proved by the documents, just as that the Palace of G Goslar was for nearly a century a favorite residence of the Salic emperors, and it also saw some splendid days under Barbarossa. But the architectural form of the building, and in particular the occurrence of trefoil arches in the substructure of the hall, must avail as compulsory evidence, that nothing of that building of Henry III has remained to us, that the existing palace is much later, and was probably built anew after its fall in the year 1132, then under Barbarossa extended by some additions. The entire palace then formed an extensive architectural group, that lay on a hill and rose effectively above the great fore-court, the present "kaiserbleek", and was then placed in connection by arched passages with the Cathedral of Henry III on the other side of the square, just as in the buildings of Charlemagne at Aix-la-Chapelle. But also the existing palace of that time was much disturbed by later rebuildings and made uncertain, particularly in the years about 1385, and finally by the modern and thorough restorations. A great part of the old general plan, namely all living and subordinate buildings, that extended around the great court between palace and cathedral, and likewise the cathedral itself, excepting its porch, have completely disappeared without traces. There yet exists the festal hall structure with its porch, and beside this and detached, except for its connection by an arched passage, the two-story palace chapel of S. Ulrich in the form of a cross-shaped central plan. In its vicinity were discovered the foundation walls of a house divided into small rooms, so that we may place there the location of the monarch's dwelling, just as in Dankwarderode. A building adjoining on the other side, which with the use of the ancient enclosing

walls, has been recently erected for living purposes, dates only from the latest middle ages, and is useless for the knowledge of the ancient imperial palace. The hall building most c concerns us (see the adjacent Plate [52]), a rectangle of about 154.2 × 49.2 ft. internal width.

Note 52. From Kunstdenkmäler der Provinz Hannover. II. Reg. Bez. Hildesheim. 1, 2. Stadt Goslar, p. 13 et seq. Hanover.1901.

It contains two great halls, one over the other, of which the lower is divided into seven narrow rooms by transverse pointed tunnel vaults, that were added in the Gothic period. Small w windows are enclosed in the before mentioned trefoil recesses and sparingly introduce light. The upper story better permits the recognition of the original condition. It appears as a v vast hall in two aisles, whose ceiling is interrupted at the middle of its length by a raised portion of the room like a transverse aisle. To this cross aisle, at the rear end of which was doubtless the imperial seat of honor, corresponds in the elevation of the front side a great round-arched opening of more than 19.7 ft. width with a roof gable above it. Now in a free modern extension is it imitated from one in the internal system of the Minster at Aix-la-Chapelle, filled by a two-story arcade, and it has no practical importance. The entire plan of the hall with its expressed transverse division permits the conjecture, that here was the ancient ascent to the emperor's throne by a flight of steps, and one may then indeed conceive the entire opening as undivided and a great plain entrance doorway of the emperial residence. On the right and left of this middle portion three triple openings with columns furnish the hall with light and air, and since by their entire form they admit of no closure, they thereby preserve the impression of an open hall, in which the imperial judgment seat was as open as possible, and stood beneath the open sky as nearly as possible. The beam ceiling of the interior is supported by wooden posts of the Gothic period; but to the ancient nucleus of the structure belongs the wall piers of the middle hall, that are decorated by late Romanesque foliage and knob capitals (See Fig. 392 in Chapter 8). On the northern end is attached to this hall building a narrow addition and portico

in two stories; in the lower story it forms a passage to the rear of the palace, and in the upper story is an anteroom to the great hall. It is furnished with an ornamental porch decorated by columns of late Romanesque forms, and to this leads a flight of steps from each side.[53]

Note 53. From Denkmäler der Baukunst, published by students of the Technische Hochschule in Berlin.

64. Palace of the Wartburg.

In such a widely extended plan, as the Castle Dankwarderode exhibits for the actual living rooms, and as we must conceive it as well for the imperial Palace in Goslar, may be reflected the custom of dwelling at the ancient court with its scattered separate buildings. From our views the comfort of living is strongly reduced by such a dispersion of the rooms, and it appears that already in the 12 th and 13 th centuries the feeling for a more habitable connection of the separate living rooms made itself felt. It must then lead to arranging the l living rooms closer together, and thus was so attained in a s series of expensive buildings, that they were grouped with the hall structure under one roof.

The transition from the originally plain two-story hall design to the compound residence building is shown to us in the clearest manner by the Palace of the Wartburg, the beautifully located seat of the Thuringian landgraves, which by historical reminiscences as well as by tale and poetry is equally wrapt in a glorifying glimmer, and is known and wondered at like no other by the German people.(Figs. 56, 58 [54, 55]). Here had t the landgrave Louis III built a palace about the middle of the 12 th century, and the two lower stories are generally regarded as that structure. Landgrave Herrmann I (1190 - 1217), the patron of poets, must have raised the hall building about one one story higher for the increased needs of the time. In the middle of the 19 th century the castle was restored, and thus also the palace in accordance with the requirements of modern courts was partially changed. Thus it is difficult to decide, whether the mode of origin mentioned above is applicable, or nothing more than merely the addition of the third story first dates from the work of Herrmann I. In any case, we must assume,

that in the two-story building Louis the Springer originally found the upper story as a great single hall, since the hall now found in the middle of that story, both from its small dimensions, as well as from its location in the midst of smaller living rooms, scarcely appears suited for use as a half open hall. So we are inclined at least to attribute the existing internal subdivision (Fig. 57) of the second story to a later architectural activity. This certainly is true of the insertion of the chapel, since this does not harmonize with the distribution of the windows on the court front.

Note 54. From Ritgen, H. Führer auf der Wartburg. -- This is certainly the modern ground plan. It is doubtful, whether all was so originally, aside from these parts, which in the interest of appropriate use could not be restored in the ancient way. We cannot investigate today, whether any vestiges e existed, even from a later time, that might indicate window closures. We do not believe in such, not even in the hall of Hermann I. Likewise doubtful are the now existing fireplaces.

Note 55. After a lithographic copy of the drawing, that was made for the purpose of the restoration. In the year 1850 an architectural student at the Carlsruhe Polytechnicum, a native of Weimar, gave such lithographs to his fellow students.

In its present condition the Palace of the Wartburg represents a substantially three-story structure of about 129.6 × 50.9 ft., whose three stories are architecturally treated nearly s similar.

The lower story is accessible from the castle court through the extreme left archway on the ground level, and it contains three vaulted rooms arranged along a corridor. The middle one one of these appears to have served as a kitchen, and it was connected with the middle hall of the second story by a small stairway in the wall; the two others may have been intended for living rooms for the retainers. To the second story leads from the court an open flight of stairs. By this one passed into a passage extending the entire length of the building with a splendid arcade opening outward, and which was separated by a solid wall from the imperial living rooms, and besides there was connected with the adjacent building with fireplace. (Keminate). On it lie two square rooms furnished with middle

supports, one of which was later vaulted and indeed in the year 1319 was arranged as a chapel. Between the two is found a hall with two supporting columns, adjoining which on the left is an elevated niche, the "bridge" or seat of the Landgrave. Besides this there remain two smaller rooms, one of which affords a passage to the room lying at the left, while in the other terminates the before mentioned stairway from the Kitchen.

In the third story a narrow corridor extends lengthwise, with open areade windows. Toward the festal hall, likewise extending the entire length, it has numerous groups of windows, so that during feasts and solemn affairs, it represented an extension of the hall well suited for spectators. Now this hall opens with a similar series of windows toward the exterior of the castle, and it may be doubtful whether this was the case originally, or rather whether only single windows penetrated the outer wall. Such a hall freely open to the air on two sides may be opposed to modern requirements for comfort, especially if one takes into consideration, that these openings probably had no kind of closure. For the ancient time, accustomed to hold public sittings of courts and assemblies under the open sky, to warm by a simple camp fire on hunts and on c campaigns in war, such a design is no longer surprising; its like is found elsewhere, as for example in Dankwarderode. How the hall was accessible in ancient times is now no longer visible; it is now reached only from the adjacent and entirely rebuilt warmed room (keminate).

65. Imperial Palace at Gelnhausen.

A similar design in several stories is to be seen in the ruins of the emperor's Castle of Gelnhausen.[56] This was also a castle surrounded by water like Dankwarderode, built about the year 1180, but in so far on a different plan, since at the entrance of the irregular egg-shaped court of the castle the warmed room was transferred over the gateway passage, while just at the left of those entering,the palace building adjoined at an obtuse angle. For the castle chapel, as which men would describe the vaulted room over the gateway, another location is made probable by the finding of the foundations of a central building in the depth of the court at the side turned from the entrance gate. The view of the palace that is given in

Fig. 59 is according to the drawings and the attempt at its restoration by Gladbach.

Note 56. See Moller, G. Denkmäler des deutschen Baukunst. Continued by E. Gladbach. Vol. 3. Darmstadt. 1851. -- Critically and in many details severely treated by L. Bickell are the construction and the general plan of the castle. (In Die Bau- und Kunstdenkmäler des Reg. Bez. Cassel. Vol. 1. Kreis Gelnhausen. Marburg. 1901.).

Here the lower story has become entirely like a cellar with solid walls and small openings for light. It is divided internally by transverse and longitudinal walls, so that a passage of about 10.5 ft. wide extends along the middle portion of the front side, behind which are separated three rooms, a larger one on the East and two smaller ones. It is further certain, that two stories rose above them, from the circumstance, that the vertical bands of the second story, remaining for the entire length of the front, are continued upward unchanged, and there may be assumed for the upper story the same arrangement of windows as now remaining below it. Also in place of the f freely restored balcony over the entrance doorway, as a design not assured in the traditions of the Italian middle ages, rather assume a similar triple group of windows, which might well find room in the existing wall space.

To the yet existing second story rose a flight of steps, now destroyed. Thus the beautiful doorway was spanned by a trefoil arch (Fig. 276), and one passed into a hall about 40.7 × 45.9 ft. with 4 columns supporting its ceiling, in which a beautiful fireplace remains at the rear wall (Plate adjoining p. 363). On the left adjoining the court was a passage of considerable width, lighted by the two groups of windows in Fig. 59, and on this lay two small rooms next the exterior of the house. Another room of irregular shape then lay in the angle between the palace and the gateway building. The whole is further connected by a stairway with the already mentioned vaulted room over the entrance, so that we here already find fine and respectable apartments closely arranged together. The same and r rather narrow stairway also represents the connection with the upper main hall of the palace, at least no vestiges of an ext-

external ascent to this are to be seen.

The dimensions of the upper hall amount to about 88.6 and 40.7 ft., thus being less than those of Dankwarderode and of the Wartburg. This may be surprising in contrast with the grand plan at Goslar, but finds its explanation also on the one hand, that the imperial court in respect to the developed subdivision among local rulers, no longer required such extensive halls, since even broad provinces of people were represented by single powerful rulers; then also in that such a later "imperial palace" was perhaps not so much intended for the needs of the imperial court itself as for those of a high official, who like a governor represented the emperor in his official province. It was scarcely possible for the emperor to remain permanently anywhere outside the country of his family. The immense difficulties, which the increased power of the princes prepared for the empire, caused that sometimes here and sometimes there disorders, strife and revolts arose. And as with the existing conditions of intercourse and of news service to conduct important state affairs at a distance, there remained nothing else, than to go to the locality of the most important occurrences, in order to restrain resistance by a strong hand. But remaining there was not for long; the same necessity soon called again to a different place. Thus so many of the "imperial palaces" bear this name only with right, because they were imperial possessions and were indeed occasionally used as stopping places, and with these also belongs Gelnhausen. The tales that the emperor himself staid there are nou numerous. Barbarossa, whose name the castle bears with the people, probably never lived until its completion.

66. Imperial Palace at Eger.

For similar requirements in rooms is also calculated the Castle in Eger.[57] There a splendidly treated castle also lies detached in the court, and the Romanesque hall building is brought into closer connection with the living rooms, even more intimately than in Gelnhausen. Judging from the arrangement of the windows, the palace contained a hall about 82.0 × 34.5 ft. in dimensions, which opened externally with 3 groups of windows, and as in the last example, was accessible by a flight of

steps. At the left adjoined then three rooms, one small and two large, one of these being regarded as a kitchen.

Note 57. See Simon, K. Studien zum romanischen Wohnhaus in Deutschland. Strasburg. 1892. -- Also Denkmäler der Baukunst. Abt. 1. Lief. 26. Pl. 10.

Palace at Münzenberg.

That at this time even lower rulers than the emperor erected buildings for splended knightly courts, and which scarcely were in ferior to the Gelnhasuen hall building, is shown to us by the very instructive palace on the hill of Münzenberg,[58] in the Wetterau. The Count von Arnsburg built it for himself about the year 1200, after he had given up his family castle for the founding of a Cistercian Monastery, and had transferred his seat to Münzenberg. On account of its valuable details, we represent it at a larger scale on the two adjacent Plates.

Note 58. Moller, G. Denkmäler der deutschen Baukunst. Continued by E. Gladbach. Vol. 7. pl. 25 to 33. p. 57. Darmstadt. 1851. -- Also in Denkmäler der Baukunst. Abt. 1. Lief. 26.

It is a hall building about 42.7 ft. long by 26.3 ft. wide, built in two stories above a substructure like a cellar, and inserted in the enclosing walls of the castle. The defensive gallery before it forms an addition of the later middle ages. The interior was divided by a row of detached supports, that supported the ceiling by means of a heavy girder; yet no remains of that exist. The lower hall was reached by an external flight of steps at the northern wall, whose traces are visible on the first of the adjacent Plates. In the interior is arranged on graceful small columns a great fireplace; the recesses of the windows next the court are so arranged as to afford seat benches at the same time; they are covered horizontally above by a wooden lintel, and are so fixed, that they may be closed by wooden shutters close behind the columns. Thus the hall was entirely closed against access of external air, and when a great fire blazed in the fireplace, it afforded a comfortable interior, even in winter. The windows of the upper hall directly above were entirely open, on the contrary. Their treatment internally and externally nowhere shows a place at which a shutter could be placed. Also the opposite row of win-

windows offers no place for a handy closure. It indeed lies in a recess 3.28 ft. deep, that is again raised by a bench, so as to afford a convenient seat with a cushion; but its width of over 26.3 ft. is too great, for one to think of adding hinged shutters. Thus we assume, that likewise this palace in ordinary times stood entirely open on both sides, affording admission to the sun and wind, in harmony with the ancient festal days beneath the open sky. This does not prevent, that perhaps in case of siege, these great openings might be closed by wooden planks, which might be supported against the beam lintels of the recesses. For the high location of the palace also offered good protection against storming, yet shots entering from a distance might easily prevent the use of the hall. This upper hall again had its chief access from externally; t the doorway is partially preserved at the northwest angle of the hall; it must have been accessible by a high flight of steps, that we may conceive were constructed of wood, although our present designing might regard as little suitable such a wooden stairway in connection with such monumental stone construction. As also shown by the not very thic wooden ceilings at the window and doorway recessed of our building, men even then thought differently from today in regard to the equal authorization of wooden and of stone construction, since they c could proceed far more carefully in the selection of materials existing in abundance, than it is possible for us to do now. It is not impossible, that in the opposite southeast angle a stairway connection led from the cellar to the upper story. The circumstance, that the floor beams there exhibit a wider spacing and the striking arrangement of the double window in the court wall may indicate this.

68. Palace Buildings in France; Sens.

The period of the old German empire was not always entirely magnificent; hot contests internally as well as externally greatly restricted the progress of architectural ciwilization; but there were yet times of animated intellectual movement, times in which Germany with comparatively united powers must appear as the leading power of the West. Evidence of this is the rich series of charming Romanesque palace structures, cho-

chosen by us through a selection of examples, such as in a similar manner no other land has produced. But since with the beginning of the 13 th century, the mediaeval idea of the German=Roman empire finally and internally broke down (its preservation through further centuries was based rather on courtly-diplomatic assumptions than upon actual conditions), then the leadership in palace architecture passed over to the meanwhile artistically and politically strengthened France. From the best period of the early French Gothic style we possess a great number of costly hall structures, which give us an imposing impression of proud wealth and of the taste of French great m men. Famous is the splendid hall, still with defiant battlements and defensive angle towers, that the Bishop of Sens built about 1240, and which we reproduce in Fig. 60 [59] from Viollet-le-Duc as one of the simplest.

Note 59. See Viollet-le-Duc, E. Dict. Rais. de l'Architecture etc. Vol. 8. p. 75 et seq. Paris. 1875.

It is of moderate size (36.0 × 125.0 ft. in round numbers), and in the upper story is covered by a series of splendidly t turned cross vaults. The lower hall and also the cellar story are each in two aisles, both being monumentally vaulted on beautiful columns. Both, or at least the ground story, played in the household of the Bishop a certain role as reception or living rooms. An internal stairway rose free in the interior and formed the connection between the second and third stories, and a vast fireplace provided for the comfort of the great room, perhaps insufficiently according to our ideas. Yet in an important advance from the heretofore considered German examples, all windows were arranged for glazing. The whole thus a affords incomparably better protection against the weather, a and the hall thus first changes from an interior intended substantially for public assemblies to an actual living apartment.

It is one peculiarity of the French civic architecture, that in comparison to German conditions, it combined its means in a smaller number of larger designs, while the lower nobility there already early preferred to serve at the court of a great noble, than to remain at a monotonous knight's seat in forest and mountain among the peasants. This had as a result, that

also the hall buildings of the French castles received very i important dimensions, and so examples thereof have come to us in Coucy, Pierrefonds, Montargis etc., of particular grandeur. They regularly lie, like the Romanesque hall buildings of Germany, in the external wall of the castle, theee bearing beneath the margin of the roof the continuous defensive gallery, but which is not necessarily connected with the interior of the h hall (see the Castle of the Order at Riga in Art. 41, Plate next page 41), and their rich window groups are turned toward the castle court. There were always preferred plans with a single aisle, that for widths of 32.8 to 52.5 ft., men preferred to cover with wooden tunnel vaults extending high into the framework of the roof.[60] An exception is formed by the hall of the royal Castle in Paris, erected by Philip the Fair, which with its dimensions of nearly 91.9 × 229.7 ft. represents the greatest of such undertakings of the middle ages, and strikingly expresses the supremacy of the royal power over the great vassals. This hall was arranged in two aisles, carried to a great height, and it was covered by two wooden tunnel vaults of the kind previously mentioned. As an actual doubling of o one of the usual castle halls, it stood over a vaulted lower story in four aisles, and also of very respectable height. Its basal form has been retained in the present promenade hall (h (hall of lost steps) of the Paris Palace of Justice, in consequence of the renewed use of the ancient foundations.

Note 60. A number of examples, whose execution in detail m must be omitted here for lack of space, are given by Viollet-le-Duc. Vol.8..p. 78 et seq..

69. Hall of the Knights at the Hague.

The influence of these grand buildings of France on neighboring countries could not fail. The vast and lofty effect of t the halls was especially transferred to the buildings of the Norman-English nobles, which we shall have to describe later. Then indeed a certain change in form appeared, when the ceiling of the hall on English soil soon dropped the form of the wooden tunnel vault, and in connection with the English-Norwegian circle of civilization passed over to the development of open and visible forms of the framework of the roof. The last German hall building, which the ideas of the mediaeval empire yet

brought forth on Dutch soil, exhibits the influence of both by its vicinity and animated commercial relations with influential countries, and it may therefore be regarded as an indeed v very independent transference of the courtly and refined forms there developed, to the still ever rather somewhat more primitive conditions of the coast of the North Sea. The Hall of t the Knights in the Binnenhof at the Hague, the ancient "Castle of Hague" of the count of Holland, was begun by William II, the anti-king of Conrad von Hohenstaufen, about the year 1250 as a true imperial hall, but indeed, since he soon afterwards died, it was first completed about 20 years later by his son Floris V.(Figs. 60 to 65 [61]). It is a vast hall structure, that stands free on three sides and occupies the middle of the castle court, being internally almost 59.1 ft. wide and 124.7 ft. long.

Note 61. From Mühlke, K. Streifzüge in Altholländische Denkmalpflege. 1904. p. 109 et seq. -- Also reprinted in Mühlke, K. Von nordischen Volkskunst. Berlin. 1906.

It rises above a low vaulted lower story and is externally very imposingly treated with a proud gable, buttresses and angle turrets, and also was adorned in later times by animated and graceful late gothic tracery. The flight of steps forming the access, differing from the previously considered buildings, lies at the free gable end of the structure. The interior is of unusual grandeur. Oven visible trusses of great oaken timbers dressed square span the hall, free from intermediate supports, so that the eye reaches to the ridge of the open roof nearly 85.3 ft. high. The trusses are set very far apart and rest on stone half columns; they are connected by purlins strengthened by braces, and by these support the entirely visible rafters of the roof. Widely spaced windows in the roof introduce some light into this upper portion of the vast interior. A great double fireplace on the eastern side of the hall served for heating; in addition must we think of the walls as decorated by rich hangings of rugs and costly fabrics, at least on festal occasions. The most effective ornamentation of such a hall indeed would always be the movement of a body of knights, gayly colored and gleaming with weapons and metal ornaments;

that gathered here about their feudal lord, whether for joyful feasts, for judgment or for state affairs.

The older group of rooms, found on the east and separated by a narrow court, did not properly belong to this "imperial hall". They consist of the ground story of a small earlier castle as well as of a nearly square hall, and form the only existing r remains of the living rooms of the Count.

70. Hall of the Knights at Marburg.

In a different and likewise very notable way is the influence of French hall buildings expressed in the beautiful Hall of the Knights of the Castle at Marburg.(See Fig. 66 [63] and Plate next p. 80 [62]), which Landgrave Henry I erected anew at the enlargement of the previously merely unimportant castle about the year 1288. It is indeed the first larger hall building in Germany, that adopted the closing of the interior by glazing from the French prototypes. Yet its plan is formed after German views in a very independent way, when it also adopts the division in two aisles for the upper hall, and avoiding the great development in height of French halls, covers it by ten cross vaults resting on stumpy octagonal piers. The detail forms of the b building are severe and dry, but are developed with great care. particularly the great windows of the hall are treated with e extreme consistence in their chamfered plate tracery, also in their lower portions being separated by a stone transom, are already arranged for the reception of movable wooden shutters. (See the corresponding representation in Fig. 315). Toward the narrow court this hall building is without decoration, in strong contrast to the French and earlier German customs; on the other hand the external side, that looks out far over the surrounding valleys, is subdivided by bold buttresses, angle turrets and a central projecting bay, severely,but very boldly and effectively. The access to the hall now leads over a winding stairway through the adjacent building. Yet it is assumed, that one formerly passed over a bridge near the doorway B into the interior. But it is perhaps more probable, that to this doorway led, not a bridge, but a flight of steps, just as in Münzenberg.

Note 62. From Mittelalterliche Baudenkmale in Kurhessen, p

published by the Society for Hessian History and Knowledge of the Country. Lief. 1. Die Schlosskapelle und der Rittersaal zu Marburg. Prepared by H. von Dehn-Rotfelsen. p. 2. Cassel. 1862.

Note 63. For the execution of our illustration was utilized Kallenbach's Atlas zur Geschichte der deutschen mittelalterliche Baukunst. Pl. 33. Munich. 1847.

71. The "Gras" at Aix-la-Chapelle.

To what small dimensions man occasionally descended in such hall buildings, the so-called "Gras" in Aix-la-Chapelle presents an example, that we place here on account of its date. It is a rectangular structure enclosed by the houses of citizens, that contains a hall story above a closed lower story (Fig.67[64]) -- the passage to the adjacent opening did not originally exist.

Note 64. Frog Bock, F. Rheinlands Baudenkmale des Mittelalters. Vol. 2. Cologne and Neuss. 1870- 1874.

Along the great group of windows of the facade, whose form in details is indeed based on modern conjecture, extends a narrow passage, called the gallery; behind it was later the judgment hall. On the exterior the great height of the building was utilized for the purpose of arranging above the windows of the gallery, a series of niches with the statues of the seven electoral princes as the finest ornamentation.

The original purpose of the building is hard to determine with certainty; from an inscription partly remaining only so much is derived, that under the government of King Richard von Cornwallis (1257 - 1272), it was built by a master Heinrich. The decoration by the statues of the seven electors certainly indicates an imperial structure; likewise the form of the upper story with the preceding narrow passage recalls so strongly the prototypes of the Palaces in Gelnhausen and the Wartburg, that we must accept the usual designation of the building as the palace or judgment hall of Richard von Cornwallis as sufficient. And indeed so much the more, since the building substantially differs from the designs of the oldest city halls, in whose number men have also desired to enroll it. T That the hall has become so unimportant in comparison with the earlier palaces of the German emperors may easily be explained

by the much less powers, that the shadow of the kingdom of Richard only obtained, compared with theirs, or on the grounds mentioned in Art. 74.

72. Hall Building at Vayda-Hunyad.

How essentially different appeared such a hall building 100 years later at the end of the 14 th century in a small castle is shown by Castle Vayda-Hunyad, which was illustrated in the preceding Heft of this "Handbook." The ground plan given there[66] allows the recognition of the hall building on the western side, placed in the defensive line and south of the entrance tower, as an important part of the entire castle. The view likewise permits it to appear especially important. As everywhere, th there are here two halls over each other, and we illustrate in Fig. 69 [65] the upper one, the lower one being indicated by the general ground plan of the castle.

Note 65. From the drawings in Wiener Bauhütte.

Note 66. See the first edition. Fig. 79.

The flight of steps is here entirely omitted; a winding stairway leads upward, as such are arranged in the castles at Coucy and Pierrefonds. Just as there is the hall building connected with the adjoining defensive towers, here with the entrance t tower at the north and a round tower at the south. Along the western wall extends a passage, that has a two-fold purpose. First as a defensive gallery it contributed to the defense of the castle, particularly in aiding in the defense of the bridge, that led to the entrance tower. A great number of archers could shoot from the bays toward the bridge, and from the windows of the passage could be controlled the opposite bank of the little river and the plain, wherever the enemy might extend. This passage with its charming architecture certainly did not possess the character of military architecture. On the general view of the castle, which we give in Fig. 68 [65], it forms with its gay gracefulness a strong contrast to the warlike severity of the remainder of the castle. Abowe the buttresses, that are attached to the lower part of the wall to support them, rise the bay windows, between them being the gallery on consoles and with rich window architecture, well adapted for an airy and beautiful retreat, And when great feasts were held

in the hall, if men sat at the drinking bouts, then could the servants pass outside in the gallery.

The hall itself, like that at Marburg, is vaulted in two aisles on a row of columns. The architectural development is simple but elegant. In this manner during the 14 th and 15 th c centuries was erected a series of hall buildings. The vaulting was in nowise absolutely retained, on the contrary, many of t these hall buildings bore wooden ceilings.

73. Castle at Büdingen.

In the preceding we see the hall structures regularly occur as a comparatively independent part of the prince's court or castle, so that it was erected detached by itself, or on a narrow space, at least left free from other rooms on both the longer sides. We see in this an echo of the incient isolated German chieftain's hall, and it is characteristic, that its influence should be strongly manifest for so long a time. How strenuously men held fast to this relatively simple ground plan is shown by examples, in which this form could only be wrung from the limited building site by a certain force. The Castle at Büdingen (Fig. 70 [67]) as a true valley and water castle lies between two branches of the Seemenbach northwest of Gelnhausen. The very old, but in later times much rebuilt and changed plan encloses an irregular roundish court; its enclosing walls to the height of 13.1 to 19.7 ft. still belong to the R Romanesque style, and consist of ashlars with boldly projecting faces, as for the neighboring castles at Gelnhausen and Münzenberg.

Note 67. See Kunstdenkmäler in Grossherzogtum Hessen. Province Oberhessen. Kreis Büdingen. p. 49 et seq. Darmstadt.1890.

The two-aisled vaulted main hall of the castle, designated by 16 in our illustration, was probably erected with the living rooms 17 and 20 in the year 1740 to replace an earlier and also Romanesque hall structure, that rose on the areas of rooms 10 to 12, and of which the gable walls with notable late Romanesque architectural forms are still preserved. Both palaces have in common, that a hall of sufficient height could not be arranged in straight form within them. In a very naive way, yet the custom of including such rooms in the single line of

of the walls enclosing the castle could not be dropped, thus producing a bent form of hall, very strongly opposed to our modern views on monumental architecture. But still this ground area has been covered by plain cross vaults on a row of stone piers, just as if its irregularities did not exist at all, also then enhancing the picturesque charm of the whole by the graceful vaulted bay of a window recess.

74. English Castles; Tower of London.

Thoroughly different from the important residences of the continent are arranged the castles, that about the same time the conquering Norman people erected on English soil.[68] Their chief part was formed by the strong residence tower (termed keep in English), a custom already impressed in Normandy, which originally in time of rebellion or feud was the last refuge of the besieged, but then gradually changed into the permanent residence of the lord of the castle. The simplest of such dwellings has about 19.7 ft. square in the interior; but frequently under the great requirements the dimensions often increase to great magnitude. Practically if the necessary rooms were to be provided for an important or even a royal court, there rise such mighty stone giants, that the name of "tower" may scarcely be applied to the defiant mass of stone. As an example of such structures may be mentioned here first in plan (Fig. 71 [69]), the building of the Tower in London, enveloped by poetry and tradition, that Duke William erected for himself immediately after the conquest of the country.

Note 68. See Muthesius. Das Englische Haus. Vol. 1. p. 15 et seq. Berlin. 1904.

Note 69. See the same. p. 19.

The ground plan comprises a rectangle of about 114.8 × 98.4 ft., and in the existing four stories is similarly divided into three rooms. For the defense of the building it is characteristic, that the living rooms are surrounded by a narrow gallery intended for defense,and are thereby protected from hostile shots. These are all rooms of imposing dimensions, among them being the important chapel extending through three stories. The main hall with dimensions of 39.4 × 95.2 ft. in the third story certainly served as a festal hall; above it are f

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found the living and sleeping rooms of the king; in the second story beneath was the great entrance hall of the castle. Winding stairways of moderate dimensions are arranged in the three corner towers and connect together the different stories.

Thus a building here appears, that might also serve as a prison in newly subjugated and severely oppressed lands, just as it was adapted to develop into broad halls a magnificent knightly and court life. At least was perhaps care taken therein for comfortable living in the closer family circle. Meanwhile is this rather the peculiarity of this single example; other buildings of the same kind were also intended more for the housing side of living. Thus Castle Rising in Norfolk [70] at first contained the same three rooms; chapel, large and small halls, indeed in substantially smaller dimensions than the royal castle of the Tower, but also with an entire number of rooms and chambers, in which a more comfortable living might occur.

Note 70. See the same work. p. 17.

These vast residence castles with their well developed forms of living are likewise the expression of the strong consciousness of power of the Norman nobility, and of its proud contrast to the subjugated people, as much as for its superior civilization. With the increasing mixture of both races, as this set in under the rule of King John Lackland and by the permission of Magna Gharta in 1215, there vanished the necessity for the important men to enclose themselves in such prison-like masses of stone. Men began to spread more freely,and similarly to the plans on the continent, to group the separate rooms around an internal court beneath the protection of towers and other fortifications. It corresponds entirely to the extremely conservative sense of the English nature, that with this and until in later times, men adhered more than on the continent to the original custom and to the arrangement of the ancient hall, without detriment to the additions, which resulted from the increased requirements of living.

75. Penshurst Place.

As an example belonging to about the year 1350 may be mentioned here the hall of the Castle of Penshurst Place in Kent.

(Figs. 72, 73 [71]). As the building of the owner of land and not of princely rank, it has the small dimensions of 78.7 × 39.4 ft., and it is valuable on account of the complete preservation of its ancient arrangement.

Note 71. See the same work. p. 23.

We see how at one end rises the elevated seat of the master; on the middle line of the room and not far from this place of honor is an octagonal enclosed space in the floor, that in the most primitive manner served as a hearth, in order to distribute in the room both light and heat from the buring of the wood laid thereon; [72] along the longer sides extend tables and benches to receive the dependents; in brief and actually nothing is changed from the arrangement of the hall as described in the ancient hero books. Only one innovation has occurred. Opposite the seat of the master was erected a gallery for the players, so that beneath it a partition of rich paneling cuts off a small vestibule. Also elsewhere the form treatment of the details exhibits wealth and refined culture. Men had long been accustomed to glaze windows, even if at first this luxury was limited to merely the upper portion, or the glazing was so fixed in special frames, that on account of its cost it could be removed in the absence of the noble family. Here in our e example the windows are large, ornamented by rich tracery in cut stone with fixed glazing. The ceiling of the hall is formed by an artistic wooden framework, that freely spans the entire width without a tie-beam. At its centre is found an opening for escape of smoke, over which men liked to place a roof turret to keep out rain as well as for a better architectural solution.

Note 72. According to Muthesius, this mode of heating for halls continued for centuries, when already all other rooms were furnished with fireplaces at the side. In the Colleges of the Universities of Oxford and Cambridge it was to be found until in the 19 th century.

This conception of the wooden ceiling, English architecture long utilized as one of its favorite ideas, and it led to the greatest undertakings. As to a climax may reference be made here to the magnificent ceiling of the vast Westminster Hall.

It represents in its way a high attainment of mediaeval architecture, since in general this entire hall, rebuilt from 1377 to 1390 by Richard III in its existing form, may be considered as the grandest and most notable historical example, that proceeded from the mediaeval development of the ancient German chieftain's hall.

76. Importance of the Hall in later Times.

Such great halls then served in later times and on the estates of the less prominent men as the crntres of the entire life and affairs. There were not only feasts held, but also the more important affairs were transacted. Particularly if the hall were arranged on the level of the ground, it developed i into a common reception hall, in which the daily assemblage of even a lesser sort, the agricultural affairs, and the business transcations connected therewith found their place. There mingled then in such halls the purpose of an imposing festal hall, the chieftain's hall in the ancient sense, with that of the a archaic hut of a single room, in which all activities of public life occurred together and successively. In this less festal conception then rooms of hall form are elements of so many important plans of residences of the later time, without possessing in themselves the entirely exceptional importance, that particularly characterized the earlier of the plans previously described. Before all for these halls were devoted to everyday life, men were accustomed to employ German designations, whose significations are not to be explained with certainty, a name that harmonizes with the idea of the halls serving for business purposes of all kinds in castles, monasteries, city halls etc., and occurring in this sense in later documents.

77. Residences of Men of Knightly Rank.

By this procedure of fusing the hall with the other rooms of the house, the old idea of the hall coincides with other forms of residences, that had developed meanwhile on the basis of simpler conditions. For beside the important courts of the princes and of great land-owners, at least after the 1 11 th century, rose the dwellings of men in the meantime rising from servile retainers of important masters to knightly condition. The position of the knight differed from that of

the ancient free owner of land, in that he must always be ready for long continued military service, and therefore he received in addition to his fief in land also sufficient labor with it to be relieved from personal labor. This "obligation to s serve" was in later times especially emphasized as not merely right, but as an important duty of honor of the nobleman, when it came to maintain the privileges of the nobility against the enriched inhabitants of cities, and to protect the rank of noble against their irruptions. Yet it would be unjustifiable to regard each possessor of a knight's fief as a rich man, who by means of his fief had settled in a stately and picturesque castle. Rather are to be found besides extensive and great b buildings of knights also very modest knightly dwellings, and naturally the development took its beginning much more from them.

The thorough difference from the ancient German court lies in the fortification of the residence, and this is based on the entirely changed conditions. Instead of the firmly adherent association of men of equal condition occurred a strong cleavage of the people into contesting ranks and parties. In the period of decaying imperial power, that substantially belongs to the appearance of the rank of knight, the citizens' war sprang from political aims, took acute forms in the separation by formation of parties, and affected the people to its lowest depths. And the chief means of carrying on the war was the injury of hostile adherents in property and estate by the devastation of the lands, by burning the houses and mills, and by the slaughter of their laborers and their cattle. Naturally men sought to protect at least their most precious possessions, by fortifying the residence with its living and dead belongings, and care for the utmost possible security began to become of essential importance in the choice of a site for the dwelling. Men preferrred either precipitous projecting hills or sought protection, both in the plain as well as in mountain valleys, behind broad moats or marshy areas. Thus the countries were everywhere covered by fortified houses in such number, that they might serve as bases for strategic combinations, but without such considerations being regarded as the purpose in

establishing these fixed points in those times, at least under the loosely connected conditions of Germany. For by far the most of these castles were still residences of a family, and therefore differ from the fortified custom houses, watch towers and valley granaries, of the kind represented by the "Tiled Tower" near Bozen, and which we must here omit as especially warlike structures.

Men capable of bearing arms were then scarce on such knightly estates of the simpler sort, indeed scarcely sufficient to defend the entire extended farmstead against a continued attack by a stronger force. Then it was necessary to unite the fortifications rather around the master's house, and its surroundings, and to secure the remaining portions of the settlement merely by a simple wall or palisades against a surprise by unbidden guests. Thus originated the everywhere commonly occurring form of a farmstead devoted to agriculture, the lower castle, behind which stood the strongly fortified inner castle. But if in the vicinity of the good farm land existed no location suitable for protected living, then the court and the dwelling were entirely separated, and the latter was built entirely independent, merely with reference to security of the location. And this custom extended, since besides the endurance of feudilism, "life in the saddle," the plundering of the weaker by the stronger had begun to serve as a source of support in accordance with rank.

78. Castle Nolling near Lorch.

Such a simple knight's residence is nothing more than a strong house. Until in the latest period it so remained, just as then Götz von Berlichingen in his memoirs, besides other appellations for the larger fortresses, repeatedly employs the word "house" for the smaller castles.[73] A good impression of such nobles' seats of the smallest kind is given by Castle Nolling, located at the outlet of the Wisper valley into the Rhine valley.(Fig. 74 [74]). It consisted of nothing more than a fortified house 23.0 × 23.0 ft. inside, whose walls were strengthened on the side of attack by a covering wall 6.56 ft. thick flanked by two round turrets.

Note 73. See Götz von Berlichingen. Description of his life

translated into New High German by Karl Müller. p. 9. Leipzig. n.d. -- "As - - - were, we traveled to upper Burgundy; we took several houses there." p. 64. -- "The confederacy had then taken the entire Wurtemberg country, all fortresses, castles, cities and houses." p. 76 et seq. -- The Castle of Battenberg in Westerwald is repeatedly mentioned as a house etc.

Note 74. From Luthmer, F. Die Bau- und Kunstdenkmäler des Regierungsbezirks Wiesbadens. Vol. 1. Rheingau. p. 123. Frankfort -o-M. 1902.

On the angle tower marked A remain vestiges of an enclosing wall; yet on account of the narrowness of the rocky hill on which the castle stands, this cannot be the attached living rooms, but only belongs to a ring wall descending from the hill, that might serve for the protection of the Wisper valley. The castle house possessed two stories, one over the other. Nothing remains of its internal subdivision, even if such existed; on the contrary there appears in the masonry the remains of a strong wooden timber construction, as well as of block steps in the form of masses, from which the decayed wood has vanished without traces. Therefore the assumption is well justified, that the castle, which was already mentioned at the b beginning of the 12 th century, was first erected as a wooden structsre and later strengthened by masonry walls.

Therefore there has remained here the stone authentication of a procedure, for example also proved to us in the settlements of the German Order by contemporary statements. Men secure and occupy a favorable location first by a blockhouse, in order to prevent its appropriation by others, then after a considerable time follow with the building of a stone fortress.

79. Castle Katzenzungen.

At Castle Nolling such an important part is assigned to the fortification, that the purpose of living is strongly neglected; hence as a further example of a "strong house" the view of Castle Katzenzunger near Nals in the Tyrol is here included, although it only dates later, from the late Gothic time. (Fig. 75 [75]). It possesses a broad cross hall, adjoining which are rows of chambers on each side, thus being a more expressive p plan for living. But it clearly shows, how such a house loca-

located on a steep hill, even against the more developed means of attack in the 15 th century, required nothing more than a defensive gallery around it, furnished with loopholes and projecting bays, to afford sufficient protection against armed attack at first. Only instead of the masonry bridge for access and the freely opened Renaissance doorway must we think of an originally movable drawbridge and a smaller entrance doorway covered by it.

Note 75. From my own photograph.

80. The Niederburg (lower Castle) at Rüdesheim.

If at Castle Nolling the strong house assumed an extremely plain form, that reminds one of the "house towers" serving the needs of more purely defensive aims, then another and not distant example gives evidence, that but little later and under like conditions of civilization, more complex forms of dwellings were required for wealthier circumstances.

The lower castle in Rüdesheim, at first the seat of the Archbishop of Mentz, then the family castle of the much branched and mighty family of von Rüdesheim, perhaps arose from a Frankish royal court, also one of the oldest, if not the earliest of the remaining German residence castles of greater extent. According to the opinion first expressed by Cohausen, that on account of the form of the few details, it was erected in the 10 th or 11 century as a plain defensive structure by the Mentz Archbishop, and then about the middle of the 12 th or in t the beginning of the 13 th century was rebuilt in a more important residence design. Then were retained the existing strong defensive towers and, with the use of the existing battlemented walls about 24.6 ft. high around the court, there was erected a series of three story wings, that also had cellars beneath on the northeast side. All rooms were vaulted, the lower story having tunnel, and the upper story groin vaults.

We give in Figs. 76 and 77 the ground plan according to the latest representation [76] of the building, and note for understanding them, that the lower castle was surrounded by water in ancient times. Under the protection of this moat extending around the building, the whole again forms a strong house, that without advanced works or special warlike arrangements off-

offered security by the thickness of its walls and the easy de-defense of its access.[77] That in the very unusual plan of the narrow stairs may be seen an increase of this safety, was stated in the preceding Heft of this Handbook;[78] we here have to do with other arrangements of the ground plan.

Note 76. See Luthmer, F. Die Bau- und Kunstdenkmäler des Regierungsbezirkes Wiesbaden. Vol. 1. Rheingau. p. 24 et seq, where other literature is also to be found. Frankfort - o .M. 1902.

Note 77. The external windows in the ground story were entirely produced by later openings made in the walls.

Note 78. First edition. Art. 130.

In the ground story we see beside the ancient corner tower the entrance, which is so arranged, that the room into which one first enters, without an intermediate floor extended up to the defense gallery of the upper crown of the wall, thus b being a sort of fortification forming an easily defended forecourt. Just at the left of the person entering here opens a doorway to a room, that we may regard as the place for an armed guard or watch. The other rooms of the ground story are all accessible from a narrow court; they may have served for dwellings of a subordinate kind, for storerooms as well as for cellars. The southeast angle of the building, whose probable outline is inserted in our ground plan according to an older representation, is unfortunately destroyed. Whether according to von Essenwein's conjecture the vaulted castle kitchen lay there or other rooms can no longer be shown. That there formerly existed a second entrance to the castle, as might be assumed from that earlier drawing, is indeed not exactly probable for reasons of the art of fortification. Three separate stairways lead from the court into the upper story, in a remarkable manner without being secured by any kind of arrangement for closing them at the lower ends. But they end above in a small and narrow room, that could be separated by strong doors, secured by heavy cross bars, from the living rooms adjoining on both sides. Below each other are the rooms connected by the stairway landings described; yet the possibility of the independent use of each room is also afforded, while the location

of the stairway is so chosen, that each chamber (the space D is an open court, as noted above) can be reached without passing through another room.

For what the different rooms of the second story served is hard to determine. One may see in the four great chambers perhaps the living rooms of the Archbishop and his dignitaries, in the hall broken at a right angle at the northeast corner a common living room and dormitory of the retainers. That such a common life was entirely usual in even important circles, we know from the descriptions by the court poets. Likewise the architectural descripion of the Monastery of Farsa (Ordo Farsensis) from the 11 th century gives no evidence thereof, when it mentions for male and female retainers, for each a common living and sleeping room in the guest house intended for the reception of important visits.[79] The conjecture is strengthened thereby, that the rooms were furnished with masonry bench seats extending along the walls.

Note 79. See Schlosser. p. 45. (Note). -- The entire passage may be mentioned here, since it affords a surprising view of the community of living at that time. Strikingly appears the strong emphasizing and the great number of privies. We might see therein a special monastic luxury.(See Latin text).

The third story has a simpler division into rooms. The stairway of the south wing also remains the same in the story beneath, which in the north wing proceeds from the L-shaped hall, ending in the third story without enclosure by a partition wall, but freely within the room, only those of the west wing h here retaining the same plans as in the second story. Thus t this third story only comprises two large halls and a small room next the small court D. This is a form at least very suitable for serving for the stay of a large garrison of troopers and their officers, even if we can no longer prove, that it was actually so utilized. In Fig. 78 we also give the section after von Essenwein's attempt at restoration, wherein only the roofs and a part of the tower rising above them are freely restored. One may see from this, how favorable for defense the entrance was arranged, and how decidedly the living rooms are separated from the middle tower, that only served for defense

and was only accessible from the upper place of defense. According to the description given above, the plan of the building makes it possible in like to gain access to the rooms of the uppermost story, and the separation of the definsive place, accessible only therefrom, from the remaining parts of the building.

Since thus at a quite early time different forms of dwellings for different requirements existed beside each other, while each man must even adjust himself according to his means, this diversity further continued until the end of the middle ages. With the improvement of all conditions of life, that the increasing development of civilization brought with it, the examples of richer plans of dwellings indeed increased, without the disappearance of plainer designs. On the contrary, these received their special improvement besides the development of palatial residences.

81. Castle House at Hattenheim.

As for what comfort required, the house built about the 14 th century by the noble von Hattenheim stands almost exactly at the same point as the Castle Nolling (Figs. 79, 80 [80]) It posseses as a main building a living tower of 35.5 × 23.0 ft. in the clear width, which contains a living room in each of t the four stories.

Note 80. From Luthmer, F. p. 182.

In the ground story are still found the remains of a great fireplace; the windows of all stories have chamfered stone jambs and corresponding central mullions. A wall is furnished with a gallery for defense, and adjoins at one corner a lower defensive tower, encloses a small court of square form, and is attached to a low and later built dwelling. Aside from this wall, the farmstead lacks all arrangements for defense, and at most it can have afforded security against the sudden attack of irregular bands. Thus it forms the transition to the simple country seats of the nobles, where fortification could often be entirely omitted, in accordance with the change in the condition of the times.

82. Sanecker Court at Eltville.

The Sanecker Court [81] at Eltville, also termed Stockheimer

Court, in such a dwelling of a truly royal stamp, and therefore well to mention here as an example, even though by its location in the outworks of the small rural city, according to its external subdivision may have already formed a transition to the city dwelling. The building (Figs. 81 to 85) by its forms may indeed belong to the second half of the 15 th century, but it still conceals in its western portion the walls of an older Romanesque structure.

Note 81. See Eichholz, E. Zwei Edelhöfe in Eltville -o-Rh. p. 117 et seq. Denkmalpflege. 1902.

It contains a single subterranean tunnel vaulted wine cellar (Fig. 81), that by an underground passage is connected with the adjoining kitchen building, and by a wide flight of steps, that at the same time served for taking in and out the wine casks, was also directly accessible from the exterior. The ground story (Fig. 83) exhibits an only later subdivided middle hall with a considerable room adjacent on the right and left. On the wall opposite the present entrance remains the traces of an entrance later walled up. We may not conclude f from this, that the building formerly served for public purposes, but see in this lower room the winepress hall with two side rooms serving in the work as well as for the administration of the farmstead. From the ground story a winding stairway leads upward (Fig. 83). There we find a little vestibule, adjoining which on three sides are the living rooms. A small apartment is added over the structure of the cellar stairs, a and a connecting passage again leads from this story to the upper story of the kitchen building. Thus the whole forms a right comfortable dwelling for a moderate requirement in the rooms, that would also well satisfy modern demands. It is there very remarkable as a reminiscence of the ancient scattered court plan, that a detached building was erected for the kitchen. The exterior exhibits plastered surfaces of quarried stone with few, though ornamentally treated details of red sandstone; it acquires an extremely attractive and picturesque effect by the harmonizing of all proportions, by the addition of the octagonal stairway tower and of the half-timber structure over the entrance to the cellar.

83. Schönborn Court at Geisenheim.

Just simplicity and lightness are the means by which in those times men combined the comfortable and joyous spirit of Rhenish life with the expression of a certain imposing reserve. And men understood how with these simple means to gracefully treat not merely such small houses. Fig. 86 represents the Schönborn Court in Geisenheim,[82], and it may show how animatedly and effectively also were treated the greater structural masses of an extensive seat of a nobleman with little greater expenditure. The building shows an astonishing similarity to the preceding example in the general design. This is perhaps to be referred to the fact, that it was erected by the same family of von Stockheim as that, and thus perhaps by the same architect.

82. From Luthmer. p. 79.

84. Thumberg near Sterzing.

Similar requirements as these seats of noblemen in the Rheingau were satisfied by many of the more modest residences of nobles in the Tyrol. We give as a characteristic example, both of the ground plan and of the architectural treatment as well, the seat of Thumberg near Sterzing in Figs. 87 to 89.[83] The structure but slowly originated in its present form. As the oldest portion must be regarded the middle part extending upward like a tower on the exterior, where it may indeed be doubtful, whether it already dates from the time about 1230, at which the little castle was first mentioned in documents.

Note 83. See Steffen, H. Denkmäler deautscher Vergangenheit. Vol. 1. pl. 8. Berlin. n.d.

It contains in each of its four stories a square anteroom w with a stairway, and three rooms accessible therefrom. From one of these rooms, that serves as a kitchen, is separated a privy externally corbelled out. Two additions of the years 1575 and 1600, but which with two and three stories each remain lower than the height of the main building, have added other warmed rooms.

We find similar ground plans at so many Tyrolese seats of n noblemen, for example at the well known Göchel's Tower in Sterzing (Fig. 397). Besides occur frequently, indeed somewhat l later in time, a form of ground plan, similar to the arrange-

arrangement of the Frankish farm house, in which the separate rooms are arranged along both sides of a great middle hall extending through the depth of the house. When such a middle hall was then allowed entirely or in part to extend through two stories and was surrounded in the upper story by connecting passages, interiors of very picturesque and rich forms originated, that acquired the highest influence in the development of later halls in country houses.

On the exteriors the Tyrolese seats of noblemen are always of great simplicity. Accompanying the deges of the roof with small battlements, as well as with stepped and battlement gables of graceful scale, as shown by our examples, are the usual and simple means by which these houses harmonize with the scale of surrounding nature. Besides the corbelled bay windows everywhere satisfy greater enjoyment in the treatment of the masses.

85. Budden House at Kammin.

We add here a house from a region further east, that in spite of many later changes has indeed retained the form of a late mediaeval important court structure, the so-called Budden House at Kammin in Pomerania. It does not especially come into consideration, that it was intended as the former Cathedral House for the reception of an important priest; for those came from the class of the nobility, and we may assume, that in their requirements for the arrangement of a dwelling, they did not differ from their secular relatives. The house has a cellar under its entire extent (Figs. 90 to 92 [84]) and again contains in both occupied stories a middle hall, but which receives the stairway in its rear portion; it is surrounded on three sides by numerous living rooms. All is managed less for magnificence than for comfort in living; even the small story heights of 9.8 to 12.5 ft. in the clear are so determined with reference to the northern climate for the same end. In the form treatment of the exterior is the rich gable with its many interlacing lines in brickwork a characteristic example of the transition forms of the Renaissance, in which the middle ages finally continued.

Note 84. From Denkmalpflege. 1905. p. 73.

86. Castle Eltz.

For the forms of such seats of noblemen some simple plans h have served as examples for the survey. Not always are the ground ideas so clearly followed; they are rather frequently dimmed and confused. To this contributes on the one hand the narrow limitation, to which house architecture must submit on a fixed castle location and in connection with arrangements for defense, whereby irregular forms and often strong displacement of some parts occur. To this was added the mediaeval custom of keeping an important castle seat as a so-called "joint castle" in common use by different branches of the family, while each family then controlled its own dwelling on the restricted common possession, there arose a mass of separate buildings, that at first makes an extremely developed impression, but on close examination separates into a number of relatively simple parts. As an example of such a castle in joint ownership, Castle Eltz near Brodenbach on the Moselle may be mentioned on account of its picturesque design. (Figs. 93 [85] and 94 [86]). It is divided into no less than five parts, that we have designated by numbers on our plan. The oldest portion is Platteltz, a residence tower 5 stories high, that is in the possession of the count of the family line. It is only connected by a low building with No. 2, Eltz-'Übenach, a rectangular dwelling showing two rooms in each story. Beyond the curved entrance to the castle with its side buildings rises in quite similar architectural forms the building group 3 - 4, which served for the two lines of Gross-Rodendorf and Klein-Rodendorf. Finally adjacent to Platteltz is No. 5, the building of the line of Eltz-Kempernich, only rebuilt after the mediaeval period. The whole rises externally in an entirely complex richness of grouping into a masterpiece of romantic and picturesque effect; likewise in the court by projections and recessions, stairways and vestibules, compose picturesque impressions in great number. But the different parts, each made independent by a separate arrangement of stairways, are in themselves of a very simple kind, easily viewed, and are entirely similar to the simple seats of noblemen first mentioned. We also find on this castle appearing so extremely rich, the opinion justified, that t the requirement made about the end of the middle ages concern-

concerning the number and connection of the living rooms, were of a quite modest kind, even in important classes.

Note 85. From Deutsche Bauzeitung. 1886. Pl. 7.

Note 86. From a drawing by R. Perret in Deutsche Bauhütte. 1907. No. 5.

87. More Extensive Residence Castles.

Beyond these limits, that were prescribed for the landed nobility, both by the customs of living and by its resources, there rise then in all lands the residences of the ecclesiastical and secular rulers. Here it was required to not only create for the small number of relatives more or less comfortable shelter; in the more developed conditions of the later middle ages it no longer sufficed, as in the 12 th century, besides the warmed room of the princely fagily to create a festal hall and merely another hall for the shelter of the retainers. Besides the dwelling of the master, and besides the rooms required for the expression of princely magnificence, there were n now needed a greater number of separate rooms for the number of court officials and other vassals, classified in more numerously graduated ranks. The necessity of providing increased space for the rooms usually devoted in limited dimensions to the earlier defense, already led to and required the combination of the formerly detached buildings into larger groups of buildings. At the same time the increasing number of occupants brought a greater comfort of existence, so that in place of the separate single structures scattered over a larger area, a united and larger building was erected, in which the different divisions could be made without leaving the protecting roof. men certainly satisfied for a long time such internal connection by the simple possibility of passing from room to room to reach the desired place. The separation of living room and c connecting corridors, indispensable to us, and which permits passage without entering the living rooms, was even yet in general unusual for the highest classes.

88. Archbishop's Palace at Narbonne.

The Palace of the Archbishop at Narbonne (Figs. 95, 96 [87]) substantially dates from the 13 th and 14 th centuries, and it may pass for a good example of such a greater design. As shown

by nur bird's eye view, it lies beside the Cathedral and is l loosely connected with it by a court with porticos, otherwise being an independent structure outside the course of the ancient city wall. One may easily distinguish in it between the arrangements serving for defense, among which the square corner tower occupies a dominant place, and the rooms for use. A And among these again the plain early Gothic hall building V [88] is separated from the wings of the living rooms.

Note 87. From Viollet-le-Duc. Dictionnaire etc. Vol. 7. p. 21 et seq.

Note 88. See the same. Vol. 8. p. 92.

These lie on both sides of the strongly fortified main entrance passage K. They contain at p and o, as well as in the w wing marked M a considerable number of rooms of different dimensions. Above the guard room lying at v v' is the castle chapel; adjoining it is a further two story building with living rooms. The expression of the whole is unusually resistant and warlike. In the massive towers and the fortifying of the external facades by battlements and pouring holes is very plainly expressed the intention to afford a counterpoise to the warlike strength of the citizens and the powerful attacks of the secular masters of the city.

According to the present views of making war, one would be inclined to assume that the vicinity of the Cathedral and the weak points, that were given for the defense in the cloister c and the garden extending to the choir of the cathedral, perhaps made it impossible to withstand a long and formal siege in this castle. But whether this assumption applies to mediaeval conditions may appear quite doubtful, if one considers, t that the example to be described soon, and which is scarcely more strongly fortified, held out during sieges lasting a year.

89. Palace of the Popes at Avignon.

In a similar sense, but considerably more spacious and greater, the vast Palace of the Popes is arranged at Avignon. Likewise in it beside the great hall, occupying an entire wing by itself, there are separate rooms of many kinds in long wings, that extend around two great courts. Both the influence of a southern mode of living as well as of a monastic life here sh

show themselves, in that one of these courts is so formed like a cloister, that along the side of the rooms next the court is added a covered portico as a connection between the separate rooms. The dimensions of the whole are too great, for us to be able to represent them here at the scale once chosen; reference must rather be made to the illustration in Viollet-le-Duc.[89]

Note 89. Viollet-le-Duc etc. Vol. 8. p. 24 et seq.

90. Bishop's Castle at Trent.

How the living apartments lie around such a court with porticos after the Italian custom, when one would arrange on the narrow area of a castle such a plan for a dwelling, may be shown by the old Bishop's castle at Trent.(Fig. 97). It is a plan entirely of the Italian kind, that is also executed in p purely Italian forms. It has retained but few remains of the ancient fortified castle, but shows in the external appearance ever yet plainly its origin.

The ancient round tower has indeed been retained, but probably only because men feared to tear down the mass of the walls, perhaps from piety, but certainly not to shut themselves up a and be besieged in it.

As the centre of the desgn appears the court B, which is surrounded by porticos in each story, in which stairways in straight flights lead upward. These porticos are adjacent to notably irregular rooms and small halls in different heights. A rich and picturesque treatment was given to the entire building: but the climax is a gallery architecture imitated from the palaces of Venice, which breaks through the wall enclosing the w western wing of the passage. As a reminiscence of the earlier time appear battlements, but which only contribute to the picturesque treatment, when they give to the building, rising high above the city, a corresponding termination.

91. House of the Grand Master at Marienburg.

Likewise to a semi-ecclesiastical class belong the great buildings for dwellings, that of the Teutonic Order Of Knights erected at the centre of their state at Marienburg in Prussia, when they stood at the height of their power. Since they had made the territory under them from small beginnings into that mediaeval state, unsurpassed in its good arrangement and close

union, then also stands the building of the seat of its grand master without comparison. The general plan of the great place of arms was peeviously giwen in the preceding Heft of this Handbook,[90] as well as the form of the ground plan of the main castle, that served as shelter for the body of the knights, a and which repeats at a larger scale the regular plan of the castles of the Orders built around a square court like a cloister, as we have explained for the example at Riga (Art. 41). We have to occupy ourselves here with the residence of the grand master standing in the lower castle. It is a stately building, that the grand master Winrich von Kniprode built for himself during the years of his government (1351 - 1382) in addition to the building of the middle castle already erected by Dietrich von Altenburg (1335 - 1341). It presents everything required by mediaeval custom for the residence of a ruling monarch -- and such a position was in fact occupied there by the grand master. Thus it makes little difference, that the grand master lived as a celibate; for he also possessed no family in the sense of kinship, but still he must provide shelter in his vicinity for what the middle ages termed his family in the ancient Roman sense; for the crowd of trusted councillors and o officials, that formed the immediate surrounding of the ruler.

Note 90. First edition. Art. 108.

Thus we find first (Figs. 98 to 101) and directly accessible from the court, the great hall of the knights, 98.4 × 164.1 ft. in ground area, that with its vaults 29.5 ft. high extended through two stories. With it by a stairway B is connected the proper dwelling of the grand master, that otherwise lies entirely independent in the uppermost story of the projecting added building. It is reached from the court by access at C and D by means of two winding stairways E and F. The lower story of the added structure contained quite a number of beautiful apartments, probably living and sleeping rooms for the immediate attendants of the grand master. His own dwelling in the third story is grouped around a very imposing vaulted hall, (Fig. 409), that separates the rooms into two divisions, and extends at the lower edge of our illustration into a broad waiting or reception hall, a sort of vestibule or "Durnitz." It

contains in one of the window recesses at G a well, and at J provides by a richly ornamented portal admission to the chief state apartment, the summer refectory (Remter), vaulted boldly on slender granite pillars 32.8 ft. high and only opening on three sides by windows with tracery.[91] (Fig. 403). Without direct connection, but reached by a small passage H without entering the great hall, it is succeeded by the more modest yet also very imposing room of the so-called winter refectory, about 41.0 ft. square and with vaults 27.9 ft. high. Adjoining it are the proper living rooms, which lie in the earlier building of the grand master Dietrich von Altenburg. On the left of the great hall are two living rooms with a private connecting passage, on the right being the house chapel with star vault, adjacent to which is the cross vaulted sleeping chamber with two adjoining chambers. Still behind is finally the house chamber into which leads the previously mentioned stairway B from the hall of the knights. A small cell K in the thickness of the wall seems to be intended for secretly observing through a slit the proceedings in the hall of the knights.

Note 91. The name of "remter" is applied to nearly all the larger halls in Marienburg. We here adhere to the local custom, without desiring to express thereby, that all these rooms were used as refectories.

All in all, with the not very extensive rooms arranged for daily use (two living and one sleeping room),are here combined a very impressive group of interiors, the two state halls (remters), the chapel and the single splendid room forming a palace hall. The stairwayu are certainly small, according to the custom of that time, partially dark and incorrect according to our ideas. But unusually good is the plan, in that in several places special corridors make possible convenient passage between the different apartments. Even in the group of rooms before the chapel and the sleeping chamber, where this is not t the case, care has been taken at least for the stairway B to be reached in two different ways. This shows an advance, that in general is not exhibited elsewhere for centuries.

Entirely outside of the otherwise usual is also the artistic treatment of the building. Our section in Fig. 101 and the 1

later internal views (Figs. 403, 406, 409) exhibit the unusually splendid effect, produced by the proud vaults and the rich tracery windows in the summer refectory, together with the dignified and also structurally very bold treatment of the palace hall, and the manner in which in addition to the splendid development of the interior entirely independent arrangements for defense fould be found at the top of the structure. In the external elevation (Fig. 100) the tense execution of the subdivision by piers imparts to the whole the impression of proud hardness, that is softened only by the window tracery and the gracefulness of the corbellings at the angles. It almost has the appearance, as if the risky supporting of the upper parts of the piers by slender granite columns is the same as to express scorn of the besiegers. Men could well do this, since t the river Nogat flowing past made it impossible on this side of the castle to bring heavy catapults as near as necessary. But with the effect of heavier cannon shots, such slender members must become dangerous, but this did not require consideration at the date of the building of this house. Yet after the lapse of a half century until heavy cannon of besiegers, like the famous "Dirty Peg" of the Elector Friedrich I of Branden berg, overthrew previous opinions upon a war on fortafications.

92. Castle Vayda-Hunyad.

Also about the same time dates the erection of Castle Vayda=Hunyad, that we described in Art. 72. We here refer to the general elevation of the castle given there (Fig. 69), since it shows, that the same tendencies as in the preceding example, also occurred elsewhere.

Likewise here the hall, which as usual was divided by a row of piers, forms a tolerably independent structure. Directly adjoining it is only a round tower capable of defense, at the other end being a room over the tower entrance furnished with two bay windows. Beside this a winding stairway forms the access from the castle court to the upper hall. As in Marienburg a separate passage, here carried along the outside of the wall of the castle, makes a connection between the stairway and the rear portion of the hall. And this passage is most gracefully

adorned by corbelled bay windows and rich traceried members, thus forming a counterpart to the decorations of the grand master's house at Marienburg. That by it the defensive capabilities of the castle were substantially reduced, we can scarcely assume with reference to its inaccessible and high location. Relatively weak parts, such as angle turrets, pouring bays and the like, men retained even after the introduction of cannon. If they were destroyed, this was no great injury, if the heavy structural masses only retained their positions. This ornamental passage appears to us only as a very successful attempt to treat the rigid masses of such a great castle more pleasingly by the piquant charm of its form treatment, and at the same t time to annex to the festal hall a passage with small and highly charming separate rooms.

93. Albrechtsburg at Meissen.

The period succeeding the erection of the buildings last described must have made the plans of fortified residences of monarch substantially more difficult, by the changes in the nature of war and by the occurrence of heavier artillery, and so much the more, since unlike the castle of the simple landed n noble, these could not by an inaccessible location enjoy a certain protection against the new war machines. On the other hand, they were also suited to make less indispensable in general strong fortifications for castles. For in a part of Europe, particularly in England and France, by the regal supremacy was peace so far established in the land, that men required less than before a permanent protection by walls and moats. B But in other countries, as in Germany, the more important landed nobles developed such an extensive association, that no l longer by the assault on a prince's castle, but first of all in open battle must be sought the decision of war.

Thus is explained that occasionally already in the 15 th century at the restoration of earlier castles the warlike capability of resistance could be left strongly inferior to considerations of magnificence and of convenience.

The grandest of all similar structures erected at the close of the middle ages in Germany is the Albrechtsburg at Meissen. 92
It indeed bears the name of castle (Burg), and also has in its

picturesque appearance something recalling such, but in fact is nothing else than a residence arranged for princely conditions, without any comparison with the castles or palaces previously mentioned. Not a single battlement any longer adorns the castle. (See the adjacent plate and Fig. 102). It was built in 1471 - 1283 by the brothers Elector Ernst and Duke Albrecht of Saxony, after the removal of the old margrave's castle by master Arnold Bestpheling,[93] as a joint residence.(Contemporary with the upper part of the cathedral adjoining the western facade). When the division of the Saxon lands occurred in 1485, Albrecht the younger received the castle, that later received his name; some small structures were yet erected in 1520 - 1524.

Note 92. See Puttrich, L. Denkmale der Baukunst des Mittelalters in Sachsen. I. Meissen. Abt. 1. Vol. 2. p. 1 et seq. Leipzig. 1846 - 1850. -- Where is also given the corresponding bibliography. -- Further, Gurlitt, C. Das Schloss zu Meissen. Dresden. 1881.

Note 93. The very common explanation of this name as Arnold from Westphalia is certainly questionable. In all cases this very important master belongs by his training, not to Westphalia, but to upper Saxony.

Above a low ground story with offices standing on a level with the court, but concealing several stories of cellars beneath itself, rise two massive and richly vaulted stories, the second story containing two great halls besides some rooms. Over this the third story comprises only small chambers, 14 in number. These halls are reminiscences of the ancient palace structures. The warmed room of the earlier period is in them placed over the palace building, whereby indeed the appellation of "kemenate" has only remained attached to the northern portion, that served for the women. Over these two vaulted stories there lies in the attic yet a third one, lighted through m massive stone dormer windows. Notable is the execution of this building in so far, that by building over the masonr haunches of the vaults, the stories become naarower upwards, so that also the story of living rooms in the roof has vertical walls standing on the lower vaults between the dormer windows. Its

ceilings are indeed formed by the first coved beams of the roof; but it would otherwise have been entirely possible to vault it. According to ancient custom, to the fore hall in the second s story adjoins a beautiful chapel, that lies in a projecting t tower. Characteristic for the structure are the window recesses found in all stories, reducing the massive walls to mere piers, and which even in the attic story are vaulted little chambers in form; then the connecting passages are partially enclosed externally. The separate stories were connected by two winding stairways, called "winding stones" in the old documents, both on the western side of the wing extending from south to north. That one located in the angle on the north wing forms the direct connection of the women's apartments in the third story with the principal hall and the court. The other is characterized by an external gallery in each story, and is the main stairway, that rises from the court to the ante hall, in which according to ancient custom the retainers and those otherwise connected with the court assembled. Yet a public court of justice was scarcely held therein longer, since also the chancellery rooms appertained thereto, which were accessible by the same stairway and were found in the third story. If we consider the latter, then the plan for a residence in common for two princely families, that with retainers consisted of about 80 persons, is not large and is only conceivable when we learn, that for example seven waiting gentlemen belonging to the first noble families occupied one room in common. Perhaps an extension would also have occurred here by other structures, had not a few years after the completion of the existing structure, one of the brothers left Meissen in consequence of the division of the country, the other retaining Meissen but transferring his residence to Dresden. Thus directln after its completion the building had become superfluous, and it chiefly served for unimportant purposes, even if it was preserved for a time.

An artistic ornamentation it therefore never received later. Our illustrations reproduce the ground plan of the second story, as well as the section through the south to north wing and the chapel tower.

94. Oxburgh Hall in Norfolk.

Yet farther than in Germany did men go in England in this d departure from the design of the ancient fortified castle. The Castle of Meissen follows in its outlines the irregular form of the rocky hill, according to ancient custom, thereby also after ancient usage receiving an enhanced picturesque effect in the interior as well as on the exterior. How men in England already at the same late Gothic period on the contrary preferred the endeavor for greater regularity may appear from Fig. 103,[94] the plan of the ground story of the Castle of Oxburgh Hall in Norfolk. The castle was built in the year 1482, and lies around a rectangular court, its wings attached at right angles. Omitting all other fortifications, it is only protected by a moat, over which a drawbridge leads to the gateway tower of symmetrical form.

Note 94. From Muthesius. p. 34.

The distribution of the rooms is again based on the regard for the great hall as the central point of the house. Adjoining it on the right are the very richly developed housekeeping rooms, according to the English custom, on the left being the principal living rooms. Very characteristic of mediaeval conditions is it, that also for this unified building erected with considerable means, the connection between the separate parts occupied as living rooms is not by corridors, but by the abundantly arranged stairways. This was originally the case in a greater degree, before some corridors were subsequently constructed in the left wing.

It should be mentioned here, that likewise in plans of castles in Moravia the form of rectangular regular court designs frequently occur.[95]

Note 95. See Prokop, A. Die Markgrafschaft Mähren in kunstgeschichtlicher Bedeutung. Vienna. 1904.

Chapter 3. City Dwellings.

95. Principal Characteristics.

When we turn to the architecture of cities, we enter a domain, that by its nature and origin must very materially differ from the preceding Chapters.

The dwellings previously described were based on the conditions of living, which have existed from the earliest times of the western middle ages; we could follow with great certainty, how they everywhere developed from the archaic conditions of prehistoric ages with tolerable uniformity. It is otherwise with city dwellings. These were developed under conditions f foreign to the earlier middle ages; for the rise of mediaeval life in cities occurred from small beginnings without direct connection with the antique city development. It already experienced the strongest opposition in the first steps of development, just because the combination of the citizens under a city government representing the community was an insoluble contradiction to the main principles of state and social classes, based only on personal feudal conditions in the early middle ages. And the cities found the strength to overcome this opposition, substantially only because in contrast to the entirely peasant agriculture of the earlier ages and to the knightly class, they advanced by commerce and manufacturing to financial economy and thereby to money power. Thus with the increasing population of the city came the crowding of many into a narrow area, that again was opposed to the rural spaciousness of all dimensions. Thus in the developed city of the later middle ages nearly all conditions grew into strong contrast with the popular traditions of the earlier time, and naturally all this was impressed on the architecture of the cities in e entirely new and unique tendencies. But these contrasts apparent to the eye are first the results of a long development. Since all city life could but gradually grow out of the surrounding rural conditions, and since in the time of its strong progress the accession of new citizens could only come from t the rural folk, then must we also assume at once, that the mode of life in the open country was at first transferred to the c city. In so far will the opinion, now a commonplace of techn-

technical literature, scarcely in theory be doubted, that the citizen's house was derived from the rural dwelling. And yet it is rash to assume, that the forms of peasants' houses known to us today were the primitive prototypes of city houses. It may already be expressed here, that in this case the citizen's house must have taken a different form, than that shown by its oldest remaining examples. This compels us to seek a different explanation of the origin of these forms of houses. But great difficulties here occur in determining the actual course of development, than in the other divisions of our description. They first of all lie in the greater diversity of requirements under which the city house was developed. We do not have before us in the city house such a uniform class of society as t the supporter of architecture, as the nobility and princes in the open country. Here the most diverse classes rather build, each in its own way. This partly lies in the first origin of the city and partly in the mode of its later development, and it is therefore differently expressed.

96. Different Composition of the Citizens.

The origin of the cities, however infinitely it differs, may be divided into two great classes for our consideration. There was formed a peculiar composition of the population, if the city grew gradually, originating as an addition to an important country residence, as occurred at a castle, a royal court, a bishop's seat, the court of a landed nobleman, or even a group of the residences of nobles, and the like. For the courts of nobles, mostly the courts of the rulers and their vassals, originally formed a special kind of buildings, and naturally these were not influenced by the peasants' houses, in which one might naturally see the prototype of the city house, but they probably represent transfers from the seats of nobles as made known to us in the preceding Chapter. Such a mode of building could not influence the gathering citizens, who at first had small means at command.

Each one in the arising cities of the 11 th century, who would pass as a citizen with full rights, must already be not o only a free man, but also acquire his own building site, with which was connected the possession of a share in the landed

estates of the city. And we may assume, that this portion of the population had in any case created for itself arrangements for shelter, which corresponded to those usual in the peasant life of the 11 th century. [96] But of these buildings nothing has remained to us; the citizens' dwellings of these cities b begin for us only at a later time, in which the progressive development an equality had been established corresponding to that already completed in the cities originating elsewher.

Note 96. This is likewise entirely true for those cities, that in an earlier period of the founding of cities first originated as purely "market settlements." If they were not also furnished with farming lands, still they had ownership or rights in the use of pasture lands etc., as may be very generally proved, thus being at least by cattle raising also closely connected with agriculture.

Besides these two important classes of the people, the nobility and the full citizens, there were quite early inhabitants of the cities to be mentioned; merchants and craftsmen especially, who did not as full citizens possess a share in the land and an entire farmstead in the city, but which as free men lived on their own bit of ground, even if a small one. For them the consideration of the requirements of agricultural pursuits entirely disappeared; they were practically free in the development of their dwellings, only being bound by the power of custom to the national style of rural architecture.

Somewhat differently and indeed more uniformly did the citizens gather at first in such cities, which without reference to important neighbors originated at a natural place for traffic, or were founded expressly by location during a campaign. In them substantially disappears that group of noble masters and important retainers. First may be assmued for them tolerably uniform buildings for the house courts of the full citizens, in which the simpler workmen found shelter as tenants. As in the cities first described, there very soon also appeared there an independent class of free craftsmen and merchants with their own building requirements. With the progressing i importance of the cities, then again so many of the nobility found it advantageous to belong to these societies, becoming

so powerful. They allowed themselves to be received as "foreigners", and thus many erected in the city their own houses, but on account of the meantime occurring increased value of t the ground in the city, this could no longer take the form of a noble's court, but became merely a stopping place. These later participations of the knightly class in the architectural treatment of the city was independent of its original mode of origin and contributed to the obliteration of the differences previously mentioned. Yet more was this then required, since in each city first described the important farm courts were mostly subdivided in later times, whether their owners willingly sold them in small lots as building sites, in order to realize the enhanced value of the ground, or that in the political contests for the mastery of the city, the nobility were generally driven out of it. Of each of the old courts then at best the master's house, often merely a small house like the last mentined seats of the nobles, alone remained as a remnant. Finally from the merchant and craftsman class, and especially in the south, certain families frequently arose to important life, even corresponding to knightly rank. The residences of such patrician families then again composed a peculiarly important class, but whose representation frequently coincides with that of the residences of the nobles.

97. Different Kinds of City Dwellings.

Thus in the description of city architecture may we obtain a comprehensive representation only by the division of the city dwellings into several groups, and we select a division between the residences of the important class, with which we have to count also the buildings of the higher clergy, and the houses of the plainer citizen class, with which are easily joined the houses of the "petty citizens", craftsmen, shop-keepers and t the like. Even with this separation into main groups the representation becomes ever more varied. This results in a great degree from the very different development attained in the separate countries. It is expressed not only in the adaptation to the climate and in the higher and lower requirements for t the comfort of the house, but also brings with itself, that sometimes handwork and commerce predominates, sometimes the ex-

export and the reception of the crude products of agriculture and voyages, or that purely traffic and finance form the chief sources of revenue of the citizens, and all these essentially influence the plans of the houses. To these are also finally added the many interlaced influences exerted on each other at the same time by the different countries, by which especially the more highly developed forms from countries with an older civilization penetrate into more distant regions by imitation and produce mixed forms.

98. Basis of the Representation.

All these very complex conditions, through which the city dwelling of the middle ages has passed, are still little investigated, and their basal tendencies have not yet been worked out in a general survey. Even the collection of the vast dispersed material is still extremely delayed in comparison with other provinces of the history of art. We give in the following an attempt at a connected description, that is substantially based on personal opinions depending on the remaining monuments of the different countries.

We give them with the reservation of certain variations in details, that may be made in such a first attempt to arrange materials of unusual complexity, but with the firm conviction, that it corresponds to the actual occurrences in everything essential.[97]

Note 97. The reasons for these views were first published in a lecture on the choice, collection and preservation of German citizens' houses, on the memorial days at Mentz, Sept. 27, 1904. See the stenographic report of the fifth day, for the c care of monuments. p. 86 et seq. Berlin. 1904.

a. Important City Residences.

99. Courts of Nobles on the Sites of Roman Cities.

The beginning of the development of cities in Germany and a also in other countries is connected with the localities, that already played an important part in the Roman period. These are indeed at first only preliminary, that have little similarity to the conditions of later times. All those sites of former splendor lay desolate, like Cologne, Mentz, Worms, Strasburg, Regensburg etc.; gardens, fields and wildernesses covered

the earlier area of the city. Even in Paris a great devastation lay between the Merovingian and the period of the mediaeval **Capets**. On the site of the late antique state buildings with colored glass windows, costly bronze grilles, canopies, gold and silver vessels, appeared shelters for distress and f fortifications. When the first settlers again occupied the old city squares, all orders and arrangements were destroyed and forgotten, that provided for safety and peace in the city domain. The city walls, so far as they remained, were too extensive to afford opportunity for a compact form of settlement. Rather the restoration of the destroyed cities was so carried out in the 5 th and 6 th centuries, that important detached courts of the king, of a bishop or other great man, as well as perhaps village groups of free peasants' courts were scattered over the wide area. The former soon induced the founding of other courts by retainers, and their endowment with a ground area also gave no occasion for economy of space. Thus a substantial portion of such a growing city consisted of imposing courts, that were distinguished in nowise from the masters' seats in the open country. So long as under the condition of freedom of the people the judgment of associates upheld the preservation of law and order, there was no inducement afforded them for fortification; a palisade or a simple enclosing wall sufficed to separate them from the open vicinity. It appears that in many places the increasing power of this popular justice was early replaced by the stern rule of royal officials, burggraves and city prefects, or by ambitious cultured ecclesiastical rulers, or that among the more important owners of the ground of many cities substantial unity prevailed, so that these cities were spared the long periods of lawlessness, such as accompanied the political contests of the empire. We may at least conclude therefrom, that the form of the unfortified court or the remains of such have often continued from the first centres of mediaeval architectural development. But otherwise, after the fall of all power ensuring order, just among the nobles of the city arose the wildest struggle for supremacy, a strife of each one against all, which led each of these small possessors of power to fortify himself on his own

land, just as in a castle. The means for this was in particular the erection of lofty towers, that by the thick stone masonry of their walls and their dominance of the vicinity, then naturally not covered by houses, afforded the greatest possible security to the possessor.

100. The Frankenturm at Treves.

Thus the residence tower also appears in the city as one of the oldest remaining forms of the monumental dwelling. It is well known, how especially on Italian soil a real competition in the erection of such strong towers appeared, and it has determined the appearance of many cities to this day, for example, of Bologna. But also in Germany are known to us several examples of such tower-like dwellings, that are to be regarded as the remains of great fortified courts. In Treves at the b beginning of the 19 th century existed an entire series; at least three are preserved to us in old drawings.[99] Of one,the so-called Frankenturm, the lower stories have remained to us, and we give in Figs. 104 to 106 [98] a view of this perhaps oldest city dwelling in Germany, as well as the plan of the second story and specimens of the beautiful details.

Note 98. From my own photograph.

Note 99. See Stephani. p. 512 et seq.

There exists no certainty in regard to the date of the structure; men vary between accepting the 10 th and the 12 th centuries. On account of the very assured and strong form treatment of the order of the upper window, which shows great affinity with the Monastery Church at Hersfeld in the mouldings, that an erection at earliest about the middle of the 11 th century is most probable.

There originally rose above the ground story at least two stories, and the uppermost story was crowned by a series of b battlements. The exterior is very carefully constructed with abundant means, faced on the surfaces with rectangular split stones, that were certainly taken from Roman ruins. Bold mouldings and belt courses with two courses each of Roman bricks subdivide the surfaces, that are bordered by great ashlars at the angles.

We have before us a building with simple plan, nothing more

than an imposing room 46.6 × 23.3 ft. in dimensions, now with a high ground story, the upper story as represented, as well as comprising a portion of the third story cut off obliquely by the roof.[100]

Note 100. It is to be noted, that the great entrance doorway of the ground story is a modern addition; formerly the ground story presented a solid wall.

The second story evidently formed the proper living room. It was lighted by small round-arched windows cut in a stone s slab, 4 on each longer side and 2 in the rear gable wall; only on the front end wall was created a richer treatment by two groups of coupled windows with stumpy columns. At A is still visible the arrangement of a doorway; there must have existed an external stairway; at B are noted the remains of a fireplace.

Thus the whole retains entirely in dimensions and arrangements the form of the hall, as we have learned to recognize it in rural noblemen's seats. It differs from these only by the strong extension upwards like a tower, whereby the small thickness of the walls yet leads to the thought, that this high superstructure was perhaps not at all at first in the plan of t the building. Like these halls, the building must be represented to ourselves as in the midst of a great court plan, surrounded by smaller dwellings.etc.

101. Residence Tower at Regensburg.

Of a different kind are the so-called war towers remaining in considerable number at Regensburg, even if they also served for the same purposes as the structure last described. One of the oldest and also the largest is the great tower with ashlar bosses, that stands behind the Cathedral and beside the ducal court on the corn market, and which is regarded by the people as a Roman work, bearing the name of the "Heathen Tower."[101]

Note 101. See Stephani. p. 411.

It is a great mass about 42.7 ft. square and 93.5 ft. high. Above a cellar now filled with earth and a tunnel vaulted lower story rise four additional stories about 32.8 ft. square inside, that served for living rooms, but are now subdivided by visibly later partition walls of the rudest kind. A fireplace of very simple form and construction, but therefore not

without further indications of great age, is contained in the angle of the second story; the lighting of the rooms is very sparingly provided by three small windows in each story, that are in part divided by graceful little columns. The forms of these columns indicate with certainty the period of about 1150 to 1200 as the date of the erection of the tower.

We represent in Figs. 107 and 108 [102] an example from a later time in Regensburg, that is located in the complex of alleys southeast from the City Hall and in contrast to the strong defensiveness of that deficient ducal structure externally emphasizes rather the habitable impression.

The tower rises as an undiminished mass above a ground plan about 24.3 × 29.1 ft. and in contrast to the proper fortification towers, it already contains the most imposing room, spanned by ribbed vaults, in the ground story. We must there already assume sufficient openings for light, although the present wide shop opening, that seemes like the show window for a tinner, far exceeds mediaeval requirements. We have correspondingly enlarged the plan and elevation. The tower contains 6 upper stories, that are internally entirely plain or even rudely treated, but on the other hand exhibit externally as a proud token of the wealth of the owner, graceful groups of windows on all four sides. In what manner the ancient stairways were arranged is no longer clear. It is certain, that the ground story was without any connection with the upper rooms, which corresponds to ancient tradition. From the fifth story upward, that is accessible by a doorway from the attic of the adjacent later house, there now leads upward a wooden stairway in two branches separated by a thin board partition. The upper series of battlements were not lacking in the ancient tradition of its use as a dwelling; we have also restored them here from other examples, and further added the roof, very probably to be assumed for German weather conditions.

Note 102. From my own drawing.

102. House of a Nobleman at Metz.

There is found in the Trinitarierstrasse in Metz the so-called Hotel S. Livier, a nobleman's residence of the 13 th century, that no longer has the form of a tower, but which still

affords a centain defensibility. Its square mass (Fig. 109 [103]) is crowned by an entirely warlike series of battlements, and a small square tower rises at the left corner about two stories above this platform for defense.

Note 103. We give the elevation in a restoration based on the latest publication in W. Schmitz' Der Mittelalterliche Profanbau in Lothringen (Dusseldorf. 1900), as well as on photographs of its present condition. For obtaining these photographs I am indebted to Mr. Secretary Winter in Berlin.

It is arranged internalln as a dovecot, but besides thes peaceful capacity, it might very well be utilized as a watch tower in warlike times. The internal arrangement of the building can no longer be determined; but one may assume, that the portion of the structure now used for a stairway below the angle turret formerly served the same purpose. To the defensible top of the house, the large openings of the front wall in each of the four stories forms an undeniable contrast. The two upper stories possess triple rectangular grouped windows, that with their charming colonnades and graceful architectraves have been well preserved to us. In both lower stories the design of window groups of like extent is attested, since their blind trefoil arches have recently appeared beneath the stucco on the wall. The openings beneath these blind arches were entirely destroyed in the 16 th or 17 th century for the arrangement of the larger windows with transom bars.

The combination of lofty towers, -- as in Regensburg, or with defensive upper parts, as in the example last described,-- and with such free opening of important lower rooms, is only to be explained by this, that those structures occupied a place around a large court area. Then the lower stories would be protected by the fortified enclosure of the court, and the defensibility of the latter was naturally increased by the high defensive roofs of the buildings mentioned.

103. Nobleman's Court at Strasburg.

The examples already described allow us to recognize, that not alone the purpose of defense influenced their erection; b but always are reflected the conditions in which the eminent owner must consider, to ensure his position in the city also,

even with arms in his hands. Another example will be contrasted with them, that informs us how the comfortable residence of an important man was planned in a city, in which under the strong rule of a bishop warlike turmoil was not to be expected. Fig. 110 [104] gives the plan of the site of a court, that existed until the year 1903 at No. 10 Thomasplatz in Strasburg under the name of "Romerhof" (Roman Court), and so far as known to me, the only one of its kind in Germany, which gave a good representation of a city court of the Romanesque period, in spite of some additions or rebuilding of a later time.

Note 104. From my own drawing.

The piece of ground lies on the Thomasplatz and at the corner of a side alley with neighbors adjacent on two sides. At the rear angle, that perhaps earlier may have formed the middle of the whole, lay the master's house, a stately side structure about 82.0 × 45.9 ft. in dimensions. On the exterior appeared remains of a plain round-arched frieze, so that we still have to do with a structure of the Romanesque period; the internal architecture only still retained vestiges of a later m mediaeval time and needs no further consideration. Between this main residence building and the side street extended a garden; adjoining the Thomasplatz were three story wooden galleries forming a connection with another dwelling of a later time, t that occupied the front corner of the site. Aside from the buildings standing on the border, the whole was only enclosed by a simple garden wall and exhibited no arrangements for defense.

104. Abandonment of Fortifications within Cities.

We must assume that such plans designed for peaceful conditions in well governed cities soon became the rule. For it would be entirely erroneous to assume, that lawlessness and wild strife prevailed permanently in them. Warlike conditions might well appear therein, just as today, when the greater political or social transformations break through the usual order. But for ordinary times by the emperor's ban and the courts of the rulers or of the citizens, care was taken to severely suppress private war. Where fortified houses still existed in c cities, the citizens labored zealously to get rid of them, and

already in the year 1180 as an expression of these conditions, the arrangement of new castles within the cities was generally forbidden by a decree of the imperial diet. Such unfortified important dwellings of the older time remain to us in great number, partly in existence and partly in drawings. As a rule they stand beside the streets and squares; but we cannot always assume this from the date of their origin. The present course of the streets cannot have determined their location; much rather may the streets have been arranged in their existing form to suit them, after the great court, whose chief buildings they once formed, had been divided and sold for building sites. That this procedure, the division of the larger areas of ground for sale as building lots for the inferior citizens actually occurred, there remains to us the evidence of documents, of which further below. If we represent to ourselves the important stone residences of the Romanesque period, that we know, as the centres of a larger nobleman's or patrician's court, we shall obtain for them an entirely different scale and also the explanation, why they are so open to the v view, even in the ground story without any seclusion or any anteroms, as they must have been open to passage.

105. Templars' House in Cologne.

One of the proudest monuments of these conditions is the so-called "Templars' House" standing in the Rheinstrasse at Cologne, a building with a facade 49.2 ft. wide, whose facade we reproduce in Fig. 111 from Boisseree. It must have been the House of the patrician family of Overstolz, and judging from its form, it must date from the first half of the 13 th century. Great openings are in the ground story 106 and do not permit the thought of the defense of such a house to occur at all. The two doorways at the right with the window lying between them correspond to an imposing hall in the lower story, that may be regarded as a reception room; on its left was a smaller room lighted by two windows with columns. Even the rear end of the house appears imposing and habitable with the rooms equipped with glazed stone windows, so that the ground story contains the most important and imposing rooms of the house.

Note 105. See Boisseree, S. Denkmale der Baukunst am Niederrhein. Pl. 35. Munich. 1833.

Note 106. Against the doubts of the existence of this building given by Boisseree very strongly appears the fact, that t the rear wall of the ground story of the house is just as strongly opened by the certainly original windows given in detail in Figs. 310, 311, 312.

Concerning access to the upper story,no starting point is p presented to us; we likewise are as little informed in regard to its subdivision. The treatment of the windows is also sufficiently expensive here, at least on the facade, to allow the thought of providing important living rooms there, although t they do not equal the windows of the lower story in the careful treatment of forms. The stories in the attic may well have served for the commerce of the patrician owner, as also for t the use of servants; in any case such a house afforded rooms enough both for the exhibition of rich magnificence and for t the home comfort of an important family.

106. Residence of the Provost of the Foundation at Aix-la-Chapelle.

To similar requirements of such a house of a noble family of citizens naturally corresponded the dwelling of an important ecclesiastic, who had to represent externally the community p placed under him. Such dwellings were often not placed among the houses of ordinary citizens, but frequently stood on the area left free around the more important churches, that as the freedom of the cathedral or foundation was not only secluded from the street traffic of the city, but was also excepted fr from the authority and justice of the municipality. We give as an example in Fig. 112 [107] the so-called House of the Provost of the foundation at Aix-la-Chapelle, that may belong to about the same time as the House of Overstolz in Cologne. The exterior shows a tolerably expressive arrangement of windows with columns, in which it is certainly to be considered, that the windows of the lower story given in our illustration and likewise in the side view are free restorations. One could a assume indeed smaller and plainer openings for lighting the p probable storerooms and servants' rooms below. More probable

for the upper stories the arrangement of grouped windows in p part enclosed by round arches; yet one must indeed prefer for these a treatment, which takes more account of the habitable character of these rooms by the possibility of closing the windows.

Note 107. From Bock, F. Rheinlands Baudenkmale des Mittelalters. Cologne.

So far as one may judge the internal plan from the arrangement of these grouped windows, the building contained in the principal story a hall with an adjacent smaller room with bay window (house chapel ?) and a similar subdivision in the upper story. Thus it corresponds tolerably well in its subdivision to what we have found in important secular residences of the same time; except that the space required for the numerous followers of the provost of the cathedral is reduced to a small ground area in consequence of the three stories of the building, probably because on this ancient area of civilization space had already commenced to become costly. For since the beginning of the 11 th century the canons of the coronation church had abandoned the earlier community life, and the separate houses intended for them must have been located closely together on the area of the ancient "cloister court." That such an expensive building as here shown could not have been erected for each of the canons is indeed clear, and so is the conjecture quite acceptable, that this occurred in the time, when the foundation enjoyed a provost of unusual importance and extremely given to building, in the person of the Hohenstaufen, Philip of Swabia.

107. House of the Count of Tyrol at Meran.

Here also belongs the picturesquely grouped house, that the Counts of Tyrol founded as a stopping place in Meran at the e end of the 15 th or beginning of the 16 th century, and which by a mistake in its character is now generally designated as the "castle" of the count of that country. It is certainly n nothing more than a small and modest dwelling intended for temporary occupation, indeed imposing enclosed externally, but scarcely capable of defense against serious attack. It adjoins in irregular form (Fig. 113) a court with wooden porticos, whhose adjacent enclosure with its narrow and low doorways is

certainly of modern origin.

In the ground story lie subordinate rooms. In the upper story here represented, from the small stairway vestibule one enters the chief apartment, furnished with a bay window, and which can be heated by a great stove, and with a servants' room beside it, further a wide passage on one side being the chapel bay (with separate sacristy), two other rooms adjoining on the other two sides. A third story then contained a number of smaller rooms for living. The house is entirely plain on the e exterior and is only effective by the impressive outline of i its roof; therefore the interior is richer and has an expression of great comfort. The internal partitions are entirely constructed of visible woodwork, and accordingly the external walls and ceilings are entirely wainscoted, the latter being subdivided by great beams. The elegant little vaults of the bay windows form a very refined contrast in form and color to the deep brownish red tones of the woodwork.

108. Compound Structures.

For the buildings previously desbribed, we could only express the conjectures, that they were formerly parts of a larger court design. But from a later time are again preserved to us examples, by which we see, how the progressive need for richer treatment of the dwellings also entirely transformed the ancient city court design. This occurred in addition to the important residences in rural regions in a way, that on the reduced area the numerous rooms were comprised in connected buildings in several stories. For larger plans the requirements then i increased, so that the necessary rooms could no longer be contained in a plain gabled structure. Entire wings were built, that either enclosed a court between them, or they were separated by a court from the everywhere already fixed city streets.

109. Hotel de la Tremoille in Paris.

In Paris was still standing in 1840 the Hotel de la Tremoille, a residence consisting of a ground story and two upper stories, executed in a magnificent architectural style,[108] which occupied about the middle of a narrow and irregular site between others, extending from Rue des Bourdonnais, where was the principal entrance, with a width of 72.2 ft. to the Rue Tirechappe.

Before the house, whose builder fell in the battle near Pavia, and which was erected about the year 1490, extends a great fore-court, with porticos on two sides, that were likewise without windows next the street and supported an upper story. Behind the house extended beside the garden a wing also with porticos, and that contained the kitchen and other offices, having its exit toward Rue Tirechappe. The whole is unfortunately now destroyed, except a few fragments, that were placed in the Ecole des Beaux Arts. We give in Fig. 114 [108] the plan of the ground story, and remark that the main building in three stories contained a considerable number of living rooms, grouped about a court D. The porticos next the street are in two stories; the rear wing built by the garden was but one story. Fig. 115 [108] may give an approximate idea of the luxuriance and richness of the detail forms.

Note 108. See Viollet-le-Duc. Dictionnaire etc. Vol. 6. p. 282.

110. Hotel Cluny in Paris.

An enclosed plan is shown by the almost contemporary and important stopping place, that the Abbot of the Monastery of Cluny built for himself in Paris. (Fig. 116 [109]). It also lies with the court next the street, thereby protecting the house from noise and curiosity.

Note 109. See the same. Vol. 6. p. 284 et seq.

Beside the main entrance lies on the left the little dwelling of the doorkeeper, only connected with the building in the ground story by an open portico. That consists of a continuous series of five separate rooms without a connecting corridor, to which are added other rooms in two short wings, made accessible by separate winding stairways. An older portion adjoins the house at the left rear angle, being the great cross vaulted hall, which passes for the last remains of a Roman baths. Next lies in the upper story the house chapel, whose apse rests on the middle pier of the lower hall by means of graceful corbelling. The external treatment is arranged for a plain, yet imposing and cheerful effect; only as a last reminiscence of the ancient feudal splendor is the effect of the stairway tower extending to the height of the ridge of the roof; it may e

express toward the street the thorough difference between such a house in comparison with the simple house of the citizen.

111. House of Jacques Coeur in Bourges.

Indeed the most magnificent of all mediaeval city residences was erected for himself after the year 1443 by the rich merchant Jacques Coeur at Bourges. For him, as a parvenu, the area of an ancient court was no longer at command, but he was compellad to purchase a suitable building site at the city wall, then of no importance. Two of its defensive towers were then included within the building (Fig. 117 [110]). Against them was placed the three story main building, following the bent course of the city wall; the three other sides of the court were enclosed by the low wings of the building. The latter substantially contained long galleries, that in ordinary times served to connect the different parts of the building and only exceptionally served for living purposes, together with the chapel over the main entrance with its small bell tower.

Note 110. From the same. p. 281.

The main building possesses in each story a middle hall, that occupies the space between the two octagonal staircase towers next the court. At one side in the ground story adjoin the k kitchens with a separate court of the offices, above being the living rooms of the owner, there also being in each story a group of apartments separately accessible, that might serve f for distinguished guests or for adult members of the family. All these rooms are characterized by the addition of numerous small side rooms and connecting corridors, similar to the subordinate rooms in the grand master's residence at Marienburg, that permit nearly all rooms to be reached without passing through the chief rooms, and which at the same time are beside the state apartments and permit the withdrawal into greater comfort. Here also is the external form treatment of the most splendid kind, suited as if to exhibit the wealth of the owner, as well as the skill of his architect in overcoming the numerous difficulties, that must result from the unsymmetrical and irregular plan of the completed whole. The piquant charm of the play of form developed here was scarcely excelled in the middle ages.

112. Ancient Court at Bamberg.

Such great wealth could also develop in France only in intimate connection with the unified royal power. It was not to be found in the more limited conditions of the German states. Indeed we yet have starting points for it in the great courts of important South German houses, that likewise there the frequently quite extensive requirements must be satisfied by large rooms.

The old court of the Prince Bishop of Bamberg offers a very characteristic example for the more modest conditions of Germany. The arrangement of the rooms is indeed similar to that of the last French residence. The whole (Fig. 118 [111]) encloses a broad court of irregular shape with low wings, in which a large number of rooms afforded shelter for the bishop and his attendants. But a half timber construction, almost to be termed similar to that of the peasants', occurs instead of the expensive and elegant stonework. Wooden galleries in the interior of the court connect the separate rooms and give to the whole a very picturesque expression. Also on the exterior is the main building constructed in plain half timber work, and only by its skilful and workmanlike jointing and the massive connected outlines of its great roof did it rise to a higher effect than its surroundings.(Fig. 119 [112]). At the angle of the stone substructure are placed the arms of its owner, as well as the date of erection in 1479; otherwise the building lacks all ornament. And yet this was the residence of one of the richest princes of the church and the scene of a splendid court life. In its halls moved a luxurious life, for which Goethe has placed a poetical memorial in his Götz von Berlichingen; on such a plain background was set off the colored magnificence of the clothing, the rich decorations by armor and furniture, which in that gay time generally came into use with increasing wealth.

Note 111. From Hartung, H. Motive der mittelalterlichen B Baukunst in Deutschland. Berlin. 1899.

Note 112. From my own photograph.

113. Houses of Fugger and of Ehrlinger.

To a not much later time belong two well preserved houses of

patricians, that may represent to us the greatest height of c city life, as attained at the close of the middle ages. It is in the great internal commercial cities of south Germany in w which were located the extended connections of the traffic of the world at that time. The magnificence of those cities aroused astonishment also in foreign visitors, and spirited descriptions remain to us, in which the houses of the citizens of Augsburg, Nuremberg, Strasburg etc. are compared to royal palaces.

At the climax of all these designs properly stood the great House of Fugger in Augsburg. A luxurious and late Gothic portal and court enclosure, covered by very artistic ribbed vaults, form the last remains of once very famous splendor, also thoroughly rebuilt some years since. Even if not of equal importance as the Fuggers, yet as capitalists the Ehringers were likewise great in Ulm, who on the security of a loan of Charles V to Venezuela furnished the money, there settling and managing the only German colony of the time, until Spanish jealousy also suppressed this beginning of a German endeavor for work beyond the ocean. Their house now contains the Gewerbemuseum (Museum of Crafts), already belongs to the transition to the Renaissance period, and is represented in the plans of the ground and second stories in Figs. 120 and 121 113). It lies free on two sides; on the third side adjoins a court surrounded by wooden porticos, as well as a side wing. The court is in direct connection with one street by a gateway, with the other by means of a passage, that passes through near the middle of the main building, now indeed enclosed by inserted windows.

Note 113. From Gurlitt, C. Historische Städtebilder. Ulm. p. 16. Berlin.

Next it lies at one side a beautifully vaulted room, that p partially receives light from a neighboring court and may have served as a wareroom or a large waiting room. Two smaller rooms for similar purposes are found at the other side of the street facade. In the rear wing on the court was formerly arranged a stairway, even if not in the great dimensions of the present one; behind it lie some smaller rooms, and beside them is a room, vaulted in three bays, that again may have been a

wareroom or a stable for horses. We find in the upper story that the main building is divided into four rooms without a connecting corridor; over the porticos of the court extend lengthwise closed connecting passages; in the extreme left corner is placed a charming house chapel, treated in the graceful forms of the latest Gothic. Both this and the small rooms behind the stairway receive their light from a small closed alley. This and the fact, that also the main structure receives its light again in the upper story partially from the adjacent ground, permits the conclusion, that even at the erection of the house, the further adjacent area formed with it a greater court design.

The exterior is kept very plain; on the contrary the internal architecture, that indeed belongs to the later Renaissance, manifests the entire wealth of the owner in splendid stucco ceilings, joinery and paintings.

114. Laube House at Ulm.

On a simpler ground plan rises the Laube House in Ulm, erected in 1573 (Fig. 122 [113]). It lies free on all sides like an important patrician's house, and it retains in the ground story the old basal form of a house plan; from whose reception h hall are divided a series of separate rooms in the monumental treatment of the Renaissance period.

Four cross vaults without ribs cover the imposing entrance hall, that is entered through a great portal. Adjoining it is a broad longitudinal hall extending to the garden side of the house; the remaining ground area is divided into separate rooms. From the hall ascends the beautiful stone stairway to the upper story, broken into two flights at right angles, and it ends there free in the middle ofa richly treated anteroom., t that receives light from one side, on the other three being surrounded by living rooms. Likewise here is the exterior kept in plain forms, but covered by rich ornamentation in painting and sgraffito.

As in the houses built in blocks for wealthy citizens and to be described later, these designs of the very great masters of commerce also found their successes, as we shall have opportunity to see in the description of the Schad House in Art. 154.

115. Important Houses of less Extent.

But the nobility not only together with the patricians, who partly came from it, formed the highest class of the great city land owners. After the power of the city community had become so great, that it formed a certain counterpoise to the likewise rapidly increasing power of the ruler of the country, it appeared advisable to many of the nobility to rely on such a strength. And as a rule the cities were favorably inclined to receive noblemen as "strangers" with the obligation to armed service for their civic rights; thereby they obtained valuable connections in the country and leaders skilled in war for their trrop of citizens or of mercenary soldiers.

Partly this drawing together of both classes and also partly merely the incitement to take part in the animated course of city life, led many nobles to create small stopping places for temporary occupation in the richer cities. There were naturally smaller requirements to be satisfied than for a permanent court; also the entire kind of a structure was usually strongly influenced, since as a rule no isolated building site could be procured, and therefore one must add to the series of existing better houses of the citizens. In this manner originated at less cost buildings of extremely simple ground plan, in which in a characteristic way the oldest German type of house, that with one room, at least in the ground story, again continued until in the latest mediaeval period.

116. Important House in Strasburg.

Fig. 123 [114] gives the plan of a ground story of such a small house of the year 1529 standing on the Broglieplatz in Strasburg, that is characterized as an important house by an elegant late Gothic bay window on the street facade, and on the court side by a rich treatment of the windows, doorways and the small winding stairway, but otherwise has been greatly changed externally. In the ground story is indeed now separated a narrow and long corridor, that in a very awkward way affords passage through the court to the stairway. But originally the entire lower story certainly formed a great single room, that represented the imposing reception room of the owner.

Note 114. From my own drawing.

117. House of a Nobleman at Schwabisch-Hall.

Assuredly proved is such a plan in the second story mentioned above (Fig. 124 114), a house that served for one of the noble families living in the anciently famous city of Schwabisch=Hall on account of its cheerful life. It lies in the "upper nobles' alley (Herrengasse) and even dates from the Gothic period, as proved by the richly treated window stories of the rear facade, but it certainly was rebuilt in the Renaissance period, and experienced an extension not represented here, from which come the richly decorated portal and the ogee gable of the facade. The ground story of this building is also now
131 divided by a partition; but its battened ceiling extends over all these parts and still rests on Gothic middle posts, showing the original unity of this entire room in the ground story.

How the upper stories of these small houses were treated can no longer be determined. For the first example we must conjecture a large rear hall and rooms cut off toward the front. F For the House from Schwabisch-Hall may be assumed,from the location of the stairway, an anteroom at the front corner on the right, adjoining which were two small or one larger room at t the elevated rear with a good outlook, with another room next the street.

118. Houses at Rothenburg -o-T, Wismar etc.

Houses of this simple ground form with a large hall with a middle post,if necessary,are found abundantly in German cities. In the Herrengasse at Rothenburg-o-T, where the nobles originally settled in the vicinity of the ancient imperial castle, they lie togethee in large numbers, indeed exhibiting greater dimensions as well as a different destination of the ground story. Men were then not accustomed to add it to the living rooms, for which sufficient space existed in the upper story; the hall is so spacious, that made accessible by doorways, it could serve as a shelter for traveling carriages and the horses of guests, at least at that time a very desirable space f for the important housekeeping of the time. Likewise the houses of ecclesiastical lords generally took similar forms. As an example may be mentioned the old Pastor's House of the Church of S. Maria in Wismar. This similarity is easily intell-

intelligible, since for both kinds of houses was similarly required a single great reception room, without side rooms being necessary for mercantile use or workshops. Otherwise such houses resemble so strongly those of the well to do merchant class of citizens (see below), that in individual cases it frequently cannot be decided of what class were their ancient occupants. 132 The later complete fusion of both classes clearly appears now in their buildings.

119. Rabe House in Rothenburg-o-T.

In Rothenburg-o-T is also found an example of the architecturally developed form of such an important reception hall, as easily resulted from the more nearly square ground area of the building site. The Rabe House at No. 9 Kirschgasse forms in the ground story a nearly square hall, gracefully covered by 4 star vaults on a slender middle support. A stairway adjoins at the side. In the upper story two intersecting partitions correspond to the transverse arches below and divide the whole into 4 rooms, that next the stairway serving as an anteroom, one as a kitchen and the other two as living rooms.(Figs. 125, 126 [115]).

Note 115. See Bau- und Kunstdenkmäler im Grossherzogstum Hessen. Provinz Oberhessen. Kreis Büdingen. p. 75 et seq. Darmstadt. 1890.

120. Schlüsselfelder House at Nuremberg.

Somewhat similar in dimensions is the Schlüsselfelder House in Nuremberg, built between 1431 and 1437, in the possession of that family until it died out, and now remaining for future time in the ownership of the Schlüsselfelder Foundation, established with the property of the deceased family. It is popularly known under the name of the "Nassau House." Although this name already occurred in the year 1600, it does not belong to the house, as conclusively proved by Mummenhof. Until 1442 it rather belonged to the Nuremberg patrician Ulrich Ortlieb, who was closely connected with King Sigismund in financial affairs, and by this relation indeed obtained the right to place the Bohemian lion (in which men long believed that they recognized the arms of Nassau) on the splendid upper story of his house beside the arms of the emperor and of the elector. The plan forms a simple rectangle; how the internal subdivision

was originally arranged, particularly how the stairway was constructed, can no longer be determined; the chief value of the building lies in its treatment by beautiful forms, the elegant bay window and rich battlement cornice, true masterpieces of high Gothic architecture.(Fig. 127). In spite of the battlements we may see in the house not a "donjon" capable of defense; for to build such would have had no purpose in the 15 th century in the well governed city of Nuremberg, nor would it have been permitted by the city council. For the citizen class after the 13 th century always jealously watched, that no new castles should be erected within the cities. Such warlike suggestive forms are here to be understood as merley knightly and court decorations, by which the wealthy owner liked to manifest his intimate relations with an important class. Therefore we hold it probable, that all the stories served for living rooms, and conjecture that in accordance with the previously described examples, in the lowest was found a reception hall, over which were small living rooms. In the third story then followed the festal hall with its beautiful bay window, which did not necessarily indicate a chapel, like many others, but indeed may have served for the secular purpose of a convenient outlook.

121. Stone House at Büdingen.

The previously mentioned examples were placed in the series of citizens' houses, which naturally formed the rule for such temporary stopping places of important nobles. But occasionally open places were yet found indeed within the city, particularly since in the now peaceful times, men no longer placed t the same value as formerly on the accessibility of the walls of the fortifications. Thus the so-called "Stone House" was so built on the "Mühlpforte" at Büdingen (Figs. 128, 129 116), that its rear end wall stands on the city wall, and that a part of the open space originally intended for the defense of the wall could be assigned to it for a court area. We are unusually well informed in regard to its origin and purpose; for it was first mentioned about the year 1518 as "the new house", that Count Ludwig II of Isenberg-Büdingen had erected for his third son in the year 1500 (or 1510).

Note 116. See Latham, F. Die Bau- und Kunstdenkmäler des Reg. Bezirks Wiesbaden. I. Der Rheingau. p. 120 et seq. Frankfort - o - M. 1902.

The ground plan of the house substantially forms an irregular rectangle with an adjacent small stairway tower, and it originally contained a single hall in the ground story. The upper stories are now variously subdivided by later walls; from the source mentioned we give the plan of the second story, that originally contained two large rooms, anteroom and hall, as well as a small bay window room. With its refined and elegant angle bay window and plain stepped gable, the exterior still makes a stately impression in spite of partially destroyed stone mullions, and a traceried gallery at the height of the second story leading from the bay window to the stairway tower has been entirely removed.

122. Hilchen House at Lorch.

As a last example of this kind may be mentioned that built by the great soldier Johann Hilchen in Lorsch -o-Rh.in 1546-8, according to an inscription. In the treatment of forms it is a transition to the antique art style of the Renaissance period and also presents in the internal arrangement of the rooms a visible advance from the similar earlier buildings, due to the influence of the widely traveled owner.

The lower story with its beautifully vaulted rooms must have served as a stable for horses. We find in each of the two upper stories (Fig. 130 [117]) a great hall and also an important living room next the street, A corridor connects both apartments with the winding stairway and at the same time forms the transition to the kitchen projecting in the rear and covered by a tunnel vault. Beside this lies in the ground story another room covered by two cross vaults, now divided into two parts by a later wall, that Luthmer conjectures to have been the house chapel.(?). The exterior receives its chief ornament by the two-story bay window of the hall, as well as by the gallery extending about it in the second story and adorned by rich coats of arms. The great gable entirely spanning the wider side of the house was only erected two and a half centuries a after the death of the field marshal in the year 1574.

Note 117. See Luthmer, F. Die Bau- und Kunstdenkmäler des Reg. Bez. Wiesbaden. I. Der Rheingau. p. 120 et seq. Frankfort -o-M. 1902.

The idea of the predominating hall building or of the single reception hall has been entirely abandoned here. As in the treatment of forms, so also in the arrangement of the ground plan, the house forms the transition to the mode of living of the period succeeding the middle ages.

b. Citizens' Houses in Blocks.

123. True Basis of Citizens' Houses in the oldest Cities. The vassals or officers of the ruler of the city, from which came the city nobility, appear in the earliest history of many cities as influential rulers in the first place; yet they and their houses, that we have endeavored to represent in the preceding, were still always in the minority in comparison with those of the simple and plain citizens, in which the independent new strength of the city early found its supporters. This class of the city inhabitants was it, which in the Rhenish bishops' cities first made German conditions prominent, frequently in strong opposition and resistance to the feudal basis of the mediaeval state. In the conditions of these first successful city communities shall we accordingly have to seek also the earliest basis for the development of the citizen's house. Whether by the great commotions and heavy losses, that the political struggles of the 11 th and 12 th centuries brought with them, trade and industry suffered most, or whether they were rather thereby goaded on to greater development, would be difficult to decide. But it is certain, that after the ending of this period of contests, the cities derived their strength from these two sources of profit far more than before, and that for many citizens agriculture, the earlier sole basis for a livelihood for the free man, passed into the background in comparison with them. From this change in the mode of living must naturally result the change from the city farmstead to the true citizen's house, that everywhere occurred with the increase of commerce and industry. But for the course of this transformation a further change in the conditions of ownership was of essential importance, developing from the fact, that

fresh masses of people pressed into the parts of the city with good outlooks. Until then but a small portion of the area of the city was occupied by houses; the larger portion was used for agricultural purposes, as shown by the view of Brunswick in a successful restoration, given in the plate adjoining page 67. Then these landed estates, partly belonging to important owners, partly to ecclesiastical associations, were subdi-
35 vided and sold as actual possessions to the newly arriving occupants. For this was often employed the form of hereditary rental. By this the purchaser had to pay ground rent, could also sell the house built by him, but the owner of the ground possessed a preemption right, and also if he wished to sell his ground. In this manner the wide areas rapidly disappeared, within which one might extend as he preferred; the ground and soil rapidly rose in value within the walls enclosing the city, exactly corresponding to modern ways, and soon house adjoined hose very closely. The limitation of space afterwards formed an important condition for the forms of the citizens' dwellings.

124. Conditions of the Building Sites of later Cities. These procedures in the oldest German cities were also further repeated by force of similar conditions in the cities founded later. From the beginning onwards were the conditions of ownership arranged likewise. It formed the rule, that on the founding of a city then the lots in similar and regularly shaped courts of tolerably imposing dimensions were given to the settlers. The dimensions of these court lots have been frequently transmitted to us; they were pretty uniform througout Germany, and for about 100 ft. in depth vary between 50 to 72 ft. in width. To this was then added for the living of the new citizen a sufficient equipment of arable land, meadow rights, etc. Thus such a newly founded city was composed of farmsteads first, and the practice of agriculture occupied a substantial place in their activity besides manufacturing and market rights. Substantially similar conditions resulted from the first, where cities were founded in the form of purely "m "market settlements," in which case each settler received only a house lot with a share in the common, but without any farm

land. The magnitudes of these are characteristically determined like those of the agricultural citizens. But also these by subdivision and sale regularly were diminished in size, so that generally the house of the actual citizen stood, not on the areas mentioned above, but on a much smaller space. And indeed the dimensions are very unequal, that we shall sometimes see shrink to very small size. Besides the differing areas then the very diverse living conditions of the various cities frequently exerted an influence upon the development of t the forms of citizens' houses in the sense of a frequently conforming diversity. For naturally must the treatment of the d dwellings proceed according to the very differing progress of the city development. Where a city permanently remained on t the standpoint of the time of its foundation, and also where the agricultural citizens, with some trades and traffic carried on at the same time, became the chief source of income, must result a greater regularity of form of the house, as well as a more intimate and permanent connection with the peasant's mode of living in the vicinity. Likewise the city plan in the simple course of the streets there frequently took the ancient and nearly a village form of courts arranged around a market place or along a long street. Such cities or villages, whose importance did not extend beyond the immediate vicinity, are found in all regions of Germany in great numbers; it is only questionable, whether we must place these dwellings generally among the examples of proper citizens' houses, or whether they should not rather be counted with the peasants' houses, since their former occupants were chiefly of the peasant class.

125. Differing Requirements of the separate Classes of the People and of the Vicinity.

Substantially otherwise was developed the mode of life in those cities, that understood by increased industrial activity and extended commerce how to win a more important position. They were first of all the locations of the previously described settlements of nobles; there the enhanced industry of the citizens produced a greater diversity among the classes of the population and of the dwellings belonging to them. Likewise in them the practice of agriculture long played an important

part; but it is still characteristic for the most important c cities of the mank of Frankfort, Nuremberg, Basle etc., that their industries were more and more by political reasons driven into the outer wards of the cities. As the last remnant of the ancient use of the court chiefly remained the raising of swine, carried on within the house, which was generally first forbidden in the 17 th century in even the most developed cities, while in the smaller ones (Bremen, Berlin etc.) men limited themselves to forbidding the freedom of the bears, or at least only permitted this at certain hours of the day.

Besides the houses of the agricultural citizens, or seen in their places appear the special houses of the merchants and of the mechanics, as the chief representatives of the citizen class. Toward the close of the middle ages there were added the dwellings of the numerous increasingly wealthy officials and of the members of the learned professions, notaries, physicians, etc. Indeed the gradually increasing free immigration of the population of the city,led after the 15 th century, at least in many cities in middle and southern Germany, already to the erection of houses, which were arranged for rental for longer or shorter periods, and to afford shelter for those not desiring to settle in the city. Thus arose already a rich graduated series of citizens' dwellings for the mere purposes of houses for mechanics, merchants etc., and therefore that the diversity of the customs of living and the local conditions also produced very different forms. Thus particularly in northern Germany, that in part was recently opened to Christian civilization, and indeed in part was so first opened during the time to be described here, the living conditions of the more important citizens were all reduced to a simpler and ruder nature, than on the older field of civilization in the south. To this was added, in opposition to a general and popular opinion, that the middle ages were entirely a period of the freest development, and by its gushing life force, scorning all rules, in the formation of all conditions, ever surprising by the multiplicity of all possible solutions for the same cases. This h had as a result, that also the different ground forms of buildings were frequently mingled together, that the influence of

more developed regions widely affected other provinces, and t that thus an almost unbounded abundance of separate phenomena appear to the observer.

126. Subdivision of the Material.

We shall attempt to obtain as correct as possible a survey of the fluctuations of this polyform development, only when we produce for comparison characteristic examples of the aforesaid ground forms. There will it serve the aim of clearness of representation, if we adhere in details less strictly to sequence in time than to the sequence of simpler and of more developed forms of houses. Likewise the occasional passing outside the period of time indicated by the title of this Heft will not be avoided, if it be thereby made possible to add good examples from the somewhat later period of the German Renaissance, for making apparent the mediaeval customs then continued. This also has historically its good reasons, in that the progress of civilization in the different regions then proceeded very irregularly, so that high development in the one and simple conditions in the other occurred at the same time. A presentation in chronological sequence would therefore afford a view of the greatest confusion instead of an actually occurring and successive development. A survey of the main outlines of this development will then of itself result from the sequence of the examples to be presented.

Merely logically and historically would it be most attractive to commence the survey with the oldest houses of the agricultural citizens, from which must have been developed the later forms. But this is impossible for the simple reason, that of these olders houses nothing has remained to us. May one explain this fact by saying, that these shelters were of too slight a kind to last for the time, or that later customs no longer corresponded to them, and they accordingly disappeared: it is correct in any case, that we have no knowledge of then based on the monuments. But the later house of the agricultural citizen cannot be taken as a starting point of the presentation, as we shall see below.

Therefore we shall so proceed, that we shall gradually pass from the simplest forms of the dwelling to those most developed.

That the combination of a citizen's life with agriculture brings with it an increase of the requirements for the house plan is clear, and so we commence the representation with those houses, for whose planning the industrial occupations of the "citizen without land and corn" was alone determinative.

127. Houses of the lower Citizens.

The simplest form of such dwellings is naturally presented by the houses of those less wealthy, whom we may comprise under the name of the "lesser citizens." If these desired to live as free persons in the city, according to mediaeval ideas, they must live on their own soil and have their own house hearth, "their own smoke." And the citizens found their advantage in favoring the settlement of the lesser citizens; for these served by their industry as mechanics and shopmen for the animated traffic of the city in a high degree. They alone made it possible to maintain the continual market in permanent booths, that in contrast to the yearly or weekly market of the small cities and villages even formed the characteristicof the more highly developed industries of the city. Thus for these less well to do settlers, who could not purchase an entire court site with the rights of a full citizen, opportunity had already been offered early for the acjuisition of a smaller building site, wheo partly larger properties of single owners or of religious societies were subdivided, partly also freely given for such purposes by the community on account of the at first still abundant unbuilt areas in the interior of the city. The previously mentioned form of ground lease was certainly properly oreated for the means of these settlers, whose possessions substantially consisted of their industry and skill, that therefore were in condition for the undertaking of a permanent rent, but not for the payment of a large purchase price.

128. Lübeck.

Figs. 131 and 132 [118] afford a representation of such a house for a mechanic or small citizen from in Lübeck. Characteristic for the entire species are the dimensions; 12.9 ft. wide and 32.5 ft. deep for the entire house, adjoining which is a small court at the rear.[119] The heights of the stories are also quite small. They are about 12.5 ft. for the ground story, 8.56 ft. in both upper stories to the under sides of the beams,

to which is added about 9.8 inches to the single boarding with battened joints forming the ceiling.

Note 118. From my own drawing.

Note 119. These are not the least dimensions of such little houses. An example of such a kind, of little importance architecturally, that I found in the Dräbbel in Munster-i-W, has in the ground story a clear width of 9.2 ft. by a depth of 17.1 ft. Above this rose three stories; behind was a small court only 7.2 ft. deep!

In spite of the small total dimensions, the little house contains quite a number of separate rooms. In the ground story one first enters a hall or workshop, from which the stairway ascends; behind is also a room, usable as a room for writing, for the master or for storage. We find in the upper story a division into three rooms. The middle room also contains the narrow stairway winding around a central post, and has the house hearth. In front is a living room separated by a half timber partition, behind it being another small room with a wooden partition. The exterior is plain and in the latest form of the north German brick architecture, but is quite carefully built.

129. Colmar, Breslau etc.; France.

The ground form here given is important, since it was followed in all German lands and even far outside them. Figs. 133 and 134 [118], 135 and 136 [120] give further examples of similar ground plans from cities as far apart as Colmar and Breslau; the last is but little changed by the arrangement of a small salesroom and of a corridor leading to the court. Quite similar plans are known to us, only to mention certain examples in the east and north at Danzig and Königsberg, Rostock, Hildesheim, Lüneberg, in middle Germany in Thuringia (Neustadt-o-Orla etc.), in the Rhenish cities of Cologne, Coblenz, Mentz etc., in Miltenberg and Kitzingen-o-M. In the south the type passes through Strasburg and Basle far into Switzerland.

Note 120. From Gurlitt, G. Historischer Städtebilder. Breslau. Berlin.

The location of these little houses in the city plan is very variable: sometimes they stand in rows beside each other in g

great numbers, where we may then assume the uniform subdivision of large gromnd areas. Sometimes they are also built separately between larger houses; the latter is to be explained by that occasionally certain larger owners of land have sold to new s settlers portions of their ground, such as a road leading to the rear court, as a useless remnant of a former agricultural pursuit.

Charcateristic for all these little houses is the triple subdivision in depth and the location of the hearth in the middle
137 room, only indirectly lighted through the house. The dimensions in width are tolerably uniform and from 9.8 to 16.4 ft.; the depth varies to a greater degree according to the form of the site, up to 65.6 ft. as the greatest. Very much rarer in Germany are houses, that consist of but two rooms in depth; a front room and a deep rear hall, the latter receiving the stairway and the house hearth. But they are found in widely removed places, as in Pilsen and in Rothenberg-o-T (the so-called House of the Jewish Teacher in the Judengasse) and indeed indicate an earlier form of the same structural idea, sounder for the direct lighting of the hearth place. Thus then also occurs the ground plan of the house of a small citizen in France. Viollet-le-Duc [121] collects examples from the little city of Monpaziers (Duchy of Guienne) founded in the year 1284 and from Laval; And Verdier similar ones from Cluny and other cities, that in magnitude and subdivision almost entirely agree with the German buildings. This astonishing similarity can be no accident; it depends upon this, that the social position a and the living conditions of the class of mechanics were everywhere substantially the same, and they made possible, like the modern rented barracks, since they satisfied the usual needs, an easy change of property and thereby a tolerably free movement of the honest city population. We are justified in seeing in these small houses the typical mode of living for the entire lower class of citizens. Aside from the low heights of the stories, which are made entirely too small for our sanitary v views, they represent to us a thoroughly comfortable and also well developed mode of living by the subdivision into different rooms. Of substantial importance for the sense of mediae-

mediaeval German house architecture appears to us therein, that in the ground story of these little houses survives the ancient hall, directly entered from the exterior. That they could not receive traffic and family life at the same time in the limited room was the occasion, that the house hearth in these houses was regularly transferred to the upper story. We must assume indeed, that the pressing need of space first compelled this decided change, by which doubtless a very important disruption was introduced into the very ancient custom of living entirely in common for all members of the family. But slowly and quite gradually did this lead in the larger houses to the transfer of the hearth and the family life into the upper story, as we shall see later. And thus we must ascribe to our s small house a peculiar importance in the history of civilization, for in it was made the separation of family life from publicity, without our being able longer to represent this as refined culture and household good fortune.

Note 121. In Dict. Rais. d'Arch. Vol. 6. p. 247, 253.

130. Improvement of the Exterior; Lüneberg, Colmar.

Just as these little houses are very similar in ground plan, their artistic treatment is variable. Here is found the greatest diversity both in simplicity and in greater richness of conception, as well as in the use of different building materials and in the treatment of the masses. In accordance with the building customs of different cities we find gables over the narrow ends, as well as two such houses combined beneath a longer gable, or the eave lies along the street, so that a narrow gable roof covers the house, rising steeply from it. Likewise in the form treatment were developed a multitude of distinct schools. Thus the brick gables of Hanover are characterized by their subdivision by stiff piers, those at Rostock, Lübeck and Lüneberg by their blind recesses, that are combined with stepped plain gable endings. In the domain of half timber construction the greater or lesser corbelling out of the stories plays a great part; besides on even these small houses also occasionally occur corbelled bay windows to animate the mass.

Thus the great multitude of these little houses forms a very

animated and instructive representation. To the plain example from Lübeck may here be added one somewhat richer from Lüneberg.(Fig. 137).

It is 21.3 ft. wide and contains a very high hall, in which is constructed over the entrance doorway a small chamber as an intermediate story. Above this is then only a single story of living rooms. A stepped gable in the Lüneberg forms characteristic of the late period terminate the little house at top and also contains over the windows the hole for a hoisting beam, by means of which the openings in both attic stories were served, and thus were the stores introduced, required for the original housekeeping of the time.

Very much lighter and more refined is treated the little house from Colmar (Fig..138 [122]), that again possesses only a single upper story besides the attic. Its effect is particularly based on the gracefully shaped and strongly projecting half timber work in contrast to the stone substructure, and this effect especially in middle and southern Germany led to the preference of this treatment.

Note 122. From my own drawing.

131. Double House in Marburg.

Thus was half timber work employed in a very peculiar manner on a small double house in Marburg, which Schäfer published after his drawing made at the time of its removal (Figs. 139, 1 140 [123]), and that from its entire style probably originated soon after a fire laid that portion in ashes in the year 1320.[124] As the oldest of the small houses of this type known to us, it requires a particularly thorough consideration.

Note 123. See Schäfer, C. Holzarchitektur Deutschlands im 14 bis 18 Jahrhundert. Berlin. N. D.

Note 124. The author owes this information to the personal aid of his honored instructor, C. Schäfer, from whose sketches he has drawn the representation of this woodwork.

Each of these two houses has a facade about 14.1 ft. wide, the entire double house being thus about 29.5 ft. The depth of the houses is also less. Besides the ground story 9.8 ft. high in the clear they have two other stories, the first having 8.2 ft. and the other only 6.6 ft. in clear height. The anci-

ancient subdiwision of the house has not been preserved by reason of many later alterations; especially lacking is unfortunately all indication of the location of the hearth. In our ground plan is therefore given only the positions of the principal supports and beams, as well as the location of the stairs. In the ground story (Fig. 139) were naturally found the workshops, through which at the same time led the access to the stairs, just as through the hall of an important person. They open directly toward the street; for they served at the same time to admit the customers, who wished to leave orders for work, and also as shops for such as purchased finished articles for storage. In many cities indeed was introduced for the latter use the severe"market law", i.e. finished products must not be sold in the house, but only in the permanent booths and sheds located on the market place. Thereby was ensured the renting of these booths for a satisfactory income, as well as the receipt of the tax to be paid on sales, of the "e "expenses"very generally collected in the later middle ages.

For the upper stories of our house must we naturally assume in each a room in front, and conjecture that the house hearth was in the second story, both from the scale of the examples mentioned, because it could only be there in the required intimate connection with the family life. The location of the s stairs then leads to the assumption, that the house was only divided in depth into two rooms, so that if there was only a small hall, in the rear was one, in which as in the chief room of the house, the family gathered around the hearth, the working place of the housewife. As a later change appears the division of this room into a narrow stairway corridor and a small rear room with adjacent privy, as it existed at the removal of the house.

Extremely remarkable is the mode of construction of this house, that stands in a certain contrast to that later usual.

For the little double house comprises 5 successive"bents", by which it is divided into 4 bays, two of which form the front room and two the rear hall with the stairs. Each bent is a s simple frame arranged with 3 vertical posts, that extend from the ground to the roof, and they are connected parallel to the

facade by notched ties.(Fig. 141). The 5 bents are connected together by notched horizontal girts, that lie below the beams, so that four gains may not fall at the same place on the post and greatly weaken it. It is notable, that both for these connecting girts as well as for the beams, the square posts have flat projections like consoles left from the round logs, on which the mortised timbers had a bearing. Curved braces and oblique timbers are gained in the sides of the house to fix the vertical and horizontal timbers, so that in the entire construction, that does not rest on wooden sills beneath, but on 15 columns set on the stone bases, a sliding or turning cannot occur. On the beams of these 5 bents lie the two lower floor beams extended toward the rear. They project at the gable end, the lower one 1.64 and the upper one 2.95 ft.; some of the beams have tenons on their ends on which are supported the posts of the front wall; into these posts are let the sills, the railing girt and a cap timber. The sill rests on the ends of the other beams, so that these also support the facade of the second story. The gable itself has further a slight p projection; the beam above the third story lies above this, so that it supports the framework of the roof. This also contains rooms, that were usable for sleeping and store rooms. Decorations do not occub, excepting the carved ends of the posts.

When the framework of the house was so constructed by the carpenter, the owner could complete it by the help of his men, when with unpeeled twigs and branches wound with straw and clay, he wattled the walls in this framework. Even for smoke f flues men were satisfied until a much later age with this simple mode of construction. The covering of the roof with straw, shingles or even with tiles, the owner himself could likewise execute; yet tile or even slate coverings also in the cities were originally found only on the houses of rich persons. The honest mechanic was satisfied with straw. Thus if he obtained the wood from the city forest, he secured a cheap house, that he could easily pay for. If then the wattled panels or spaces between the timbers of the facade were smoothly covered with clay from a free hand and then coated with limewash, the woodwork being tinted with red chalk or yellow ochre, then where

such a house adjoined another, each furnished with its particular sign, from which it was named, the street presented a friendly appearance, and life therein might be very comfortable, if master and journeymen worked industriously in the open workshop, where a song started somewhere and passed from one workshop to another, if children filled the street and played there, watched and controlled by the mothers at the windows, the neighbor women at work and exchanging their news from the windows, the old people sitting on the benches before the houses, and customers passing along the streets.

The method of construction of this Marbugg house is plainly based on the custom of erecting the entire house from the ground to the roof at one time, treatment the division into stories as accessory in the second rank. This is manifestly connected with this, that as shown in Art. 7, men started from the one story hut furnished with open framework of the roof. How men first introduced into this simple interior subordinate intermediate floors, is shown by the House at Kreste (Figs. 4 to 6), and it is very easily undestood, that in the half timber construction house, men added such subordinate divisions as independent additions in the continuous portions of the posts of the wall. That these insertions of beam ceilings were then retained, when the separate divisions grew to full stories is likewise readily explained by the perseverance of manual labor. The later common method and that above several windows, that the stores are each independently constructed above each other included in itself for the early mediaeval custom a breach with tradition. No other example longer remains, that so fully carries out this mode of construction of external walls and internal supports, as our double house; but less complete reminiscences of the ancient customs are found right frequently still. Examples of such citizens' houses shall we yet have to mention in other places; but much more common is this mode of building in rural architecture, where continuous timbers extend through several stories, especially at the angles, and from east of the Elbe to Alsace have remained until nearly our own time.

132. Double House at Laval.

132. Double House at Laval.

Already to the 15 th century belongs a double house in Laval (Fig. 142 [125]), that we mention here from the rich abundance of beautiful old dwellings, which were preserved on French soil, at least until recently. It strikingly corresponds in dimensions and arrangement of ground plan to the previously given German examples; only it has the considerably greater depth of 49.2 ft. and the stairs therefore extend lengthwise. The elevation is in contrast to the fancifully overhanging facade of the German example, and is characteristic of the less expensive style of French half timber construction, that also later sought its charm less in the expressive treatment of the architectural members, than in the covering of the surfaces by carvings imitated from stone architecture.

Note 125. From Viollet-le-Duc. Vol. 6. p. 253.

133. Stone Houses of small Citizens at Cluny.

In Germany and also in northern France wood construction permanently long continued to predominate over masonry construction. Where the latter already occurred in the 13 th century, as in the houses from Gelnshausen published by Bickell, it is very plainly treated as a rule. On the contrary for southern France and Italy already from the early period stone examples exist of even such houses. In Fig. 143 [126] on the right, we represent such a one (from Cluny), in which certainly the strict closure of the ground story can scarcely be regarded as original, but must be a modern restoration. Otherwise the little house, that is not the only one of its kind, corresponds in dimensions to the previously given German examples. It certainly far excels in the richness of its decorated window forms those, which could be employed in Germany at about the same time, i.e. toward the end of the 12 th century.

Note 126. From Verdier, A..and F. Cattois. Architecture civile et domestique au Moyen-age et a la Renaissance. Vol. 1. p. 69 et seq. Paris. 1864. -- The authors give there nine Romanesque house facades and designate in the plan about 25 at least there of dwellings from the 12 th century, that it is to be hoped still exist today.

Under the conditions of southern France with its wealth of

earlier civilization were then developed other ground forms u under antique influences indeed, which make an impression of higher development by the inclusion of a court. We give in plan and elevation a somewhat larger house of such a kind, likewise from Çluny.[127]

Note 127. From Viollet-le-Duc. Vol. 6. p. 222, 224.

We see here (Figs. 144 to 146) how the stairway directly adjoins the entrance of the house, being separated by a wall from the room beside it, that formed a shop or workshop. A small court F with wall G adjoins in the rear; along it extends the pohtico E to the room H, designated as the kitchen by Viollet-le-Duc by reason of the great smoke hood I, but in this l location so far from the actual living room is rather to be r regarded as the workshop of an armorer or other worker with fire. In the upper story the stairs end free in the large chief apartment L, the day living room of the entire family, and which with its large fireplace also served for preparing the food. The gallery N here also contained a small attic stairway ending in a rear sleeping room.

134. House at Caussade.

Other masonry houses remaining in southern France strongly recall Italian buildings. Thus a house at Caussade (Fig. 147[128]), that exhibits an increased width of 27.9 ft., and it is indeed only to be included in our group with the reservation, that e enlargement of the lower story according to Viollet-le-Duc, as an open shop or workshop is true. It contains in each of the second and third stories an approximately square hall and a small room, with three rooms in the fourth story besides the stairway. The facade was erected in early Gothic forms in brick mixed with cut stone in very monumental style, and in its entire appearance has strong reminiscences of the palaces of the nobles in Siena.

Note 128. See Viollet-le-Duc. p. 235.

Likewise among the great structures of its kind belongs a half timber house in Caen with a facade of nearly 23.0 ft., d dating from about the first half of the 15 th century.(Figs. 148, 149[129]). It again possesses in the ground story beside the entrance the somewhat larger room for the shop or workshop.

Above this are corbelled out two upper stories in forms, that with little projecting columns and buttresses represent a transition to the extremely rich treatment, which was occasionally employed in French half timber construction of the late Gothic period.

Note 129. From Gailhabaud, J. L'Architecture du V au XVII me Siecle et les Arts qui en dependent. Paris. 1820 - 1859.

135. Houses of well-to-do Citizens; Merchants' Houses.

The houses last mentioned already by their magnitude and treatment form the transition to the greater houses of the well-to-do citizens and merchants. It would be quite erroneous to assume a deep chasm between the two classes; but as the skilful mechanic competed very well with the smaller merchants in thrift, and indeed could even attain to a greater business, thus the dwellings of both classes exhibit a more gradual change. In fact we find for the species of houses, that we will designate as merchants' houses from the predominating class of their owners, very simple conditions in control and can follow the influence of this simplicity into a time so much later, t the longer the region to which the buildings under consideration belonged adhered to simpler and ruder living conditions. Therefore we shall subdivide our examination here rather by r regions, and will begin with the buildings of northern Germany. For there were a series of circumstances at the time opposed to further development into more refined customs of living; t the generally poor nature of the country in regard to the products of the soil; then the fact, that the traffic of these regions was based rather on agricultural products and on the importation of bulky goods and raw materials, than on more finely developed manufactures; also finally the manner of carrying on the traffic, which led the rich merchant on dangerous journeys lasting for months to the rude north and to the uncultivated east, therefore permitting to find comfortable a comparatively simple mode of living.

136. Merchant's House at Lüneberg.

The ground form of the merchant's house in north Germany returns to the living conditions of the oldest simple house, and indeed even more distinctly than that. A very clear example

of this is afforded by the House near the harbor in the Lünenstrasse at Lüneberg in Figs. 150, 151 [130], in spite of the fact that it only dates from the end of the 15 th or even the beginning of the 16 th century. If we neglect some later and not very important alterations, it forms in the ground story substantially a great hall occupying the entire ground area and t the comparatively imposing height, that received abundant light from the free longer side by four high windows subdivided by mullions. Only in the right corner of the front was a small room separated from the first, certainly as an office and reception room of the merchant, to whom the house belonged. The bay window built before this room as well as that corresponding on the nearer half of the facade are additions made after the mediaeval period.

Note 130. From my own photograph.

Over this small room, that still retains its ancient ceiling of coved beams is arranged a similar room as an intermediate story, and this story rests on a girder supported by beautiful wooden posts, continued in like width through the entire depth of the house. It contains 3 chambers, the two in the rear only receiving light indirectly from the hall. Beneath this in the thereby separated low part of the great hall are both the stairs to the rooms of the intermediate story, as well as the house hearth. Since the hall has a clear height of 14.7 ft., there remains for these separated rooms only a height of 7.0 ft. beneath the beams, by which we then again pass to proportions, that prevailed in the houses of the small citizens.- Above the hall was also constructed another story; but this w was not intended for living purposes, but as shown by the absence of windows at the sides and the existence of openings for goods over the entrance doorway, it served as a storeroom for trade goods, as well as the attic above it. Even if we a assume, that in these wide storerooms were constructed by screens sleeping places for servants, [131] then these temporarily separated rooms were very insignificant.

Note 131. It is also not impossible, that at least the men servants even slept in the hall, as they still frequently pass the night in Russia in the hall before the doors of the rooms of the masters.

We must assume that the entire daily life of the family, visits of friends and relatives, all larger assemblages and other activities connected with the pursuit of traffic occurred in the great hall, so far as the latter were not found in the office of the merchant. Here as Möser already stated in regard to the Saxon peasant's house, the housewife could from the hearth overlook and control the entire course of the houskeeping; she could take part in the business pursuits of the master, a and in case he were absent on business journeys, could indeed in his place herself oversee the current transaction of the business.

And yet such a house afforded but little convenience, according to our conceptions, and is not to be regarded as equal to the dwelling of a citizen of lesser means. To assume this already forbids the development of the beautiful gabled facade, that with its rich subdivision by members twisted like ropes, and the insertion of round panels decorated by reliefs, represents one of the most expensive examples of its kind. But still more is this assumption faulty, that houses of similar kind are commonly found, both in Lüneberg itslef as well as in the other eastern Hansa cities of Lübeck, Rostock, Wismar, Stralsund etc. They frequently have greater dimensions, as for example the House in Lüneberg at Berg No. 39, that so far perhaps preserves an earlier type, since over the enclosed writing room of the master is no upper room, but a free balcony. Also certain variations in details occasionally occur, without any essential change in the general forms..

137. Lion Pharmacy at Lübeck.

Thus from the series of similar designs, partly coming down into the 18 th century, that Lübeck contains, is prominent the House of the present Lion Pharmacy. Its well preserved rear gable even goes back into the late Romanesque period, but its chief parts only date from the 14 th century, and it is proved to have been one of the most important houses of its time, because in the year 1375 it served as a residence for the wife of the emperor Charles IV. Before the restoration there were on its free wall still plainly to be seen the remains of the original arrangement of the windows, and from these it result-

resulted, that the entire front portion formed a high wall, in whose rear corner was constructed a small room with an intermediate story. This house indeed exhibits an enrichment, in t that at the opposite corner was added a spacious room in the Gothic period, and it shows a smaller gable toward the street. The form of ground plan thereby produced, consisting of a deep main house with a smaller and shallower addition, is not seldom found in German cities, so that one may assume a common reason for its origin. Probably its plan may be explained by this, that the space of a passage leading to the rear court at an earlier time was utilized for such an addition of a state apartment, when such passage appeared superfluous on account of the abandonment of agricultural pursuits.

138. House at Münden.

According to the extent and also indeed the date, that may be placed at about the beginningoof the 15 th century, is to be placed here a House from the "Dunkeln Strasse" (dart street) in Münden (Fig. 152 [132]), that is still preserved under the o old name of "Zum Ochsenkopf" (To the Oxhead). The front third of this house, which is alone published, possesses three low stories below the projecting attic storeroom, thus rejecting the usual plan of the high front hall. This is found in the rear and larger part of the house, thus occupying about one and a half times the height of the front stories. Over it is found another story, that then ends below the attic storeroom, like the third intermediate story of the front portion.

Note 132. From Schäfer, C. Holzarchitektur vom 14 bis 18 Jahrhundert. Berlin.

How this house was utilized and whether a hearth existed in the rear hall is no longer to be determined. Now the rear hall in both stories and also the front third story, together w with the entire projecting storeroom story, are without any divisions by walls, that indicates the use of these rooms for l living purposes, so that only in the front rooms of the lower story may be regarded as living rooms. Very notable is the method of construction of the house. It forms a kind of intermediary between the entirely ancient construction of the Marburg House (Art. 131) and the later construction in stories.

It stands yet on the vertical posts of the external walls extending through all the stories from bottom to top, even if no longer with separate posts supporting girders.(Fig. 153). These are set as closely as the beams are placed, so that all beams lying over each other in the lower stories on each side a are borne by such posts, and thus form a transverse tie across the house. The beams are tenoned into the posts, besides which the portion left beside the tenon extends into an oblique gain. For the lowest series of beams the tenons pass through the posts, extend considerably outside them, and are fastened by an inserted wooden key, so that the entire house has a strong tension transversely. A considerable number of such ties are behind each other. Their connection together from the street is formed by a longitudinal girder extending in the middle of the house and its posts, that indeed in the lower of the two stories next the hall can only extend to the rear wall of the front stories. All floor beams then run toward the depth and with transverse beams a further and very strong tie in depth is formed for the great posts of the walls. In the wall surfaces of its side walls are omitted all oblique timbers, so that the addition of a projecting gable, that has braces and cross girts and rests on short beams extending back at least to the next beam from the front, also indicates a substantial fastening. The posts themselves are naturally weakened by the tenons of the beams. In order to not allow too many weak places at the same point, the horizontal girts are nowhere placed at the same height as the beams, but are arranged at pleasure between them. They are so placed on the facade, that the windows have the necessary height.

If this mode of construction appears irregular at the first glance, it has endured well and is remarkably suited to the p peculiarities of wooden construction. It avoids the numerous divisions of the supports by stories, in which the placing of ends on sides of timbers regularly gives opportunity for unequal settlement. It connects the stiff external walls with long timbers by the alternating directions of beams and girders in a very superior and suitable manner. Certainly on account of the great number of long and straight oak timbers required,

it must have been costly even then, and for this reason it had to give place to construction by stories.

139. Stone Gabled Houses in Westphalia.

If wooden construction predominated almost without limit in the mountain regioms of the Harz mountains and on the Weser, then in the dajacent Westphalia was more commonly employed pure masonry construction. Two Gothic houses with very strongly ancient stepped gables from Stadthagen, that indeed certainly date still from the 14 th century, we have to describe in describe in another place on account of the later rebuilding construction undertaken on them (Art. 169). Others of like kind are found, or at least were found recently in Lemgo (Art. 291), Herford etc. The richest development was experienced by these Gothic gabled facades, to which belong plans similar to those last described, as in Münster, where they adjoin each other on the chief square of the city, the elongated "principal market", forming in a proud series one of the grandest city views in t the middle ages. They are here particularly expressive, since the facade in the ground story opens by the arrangement of a high vaulted porch. But this enrichment in appearance is not a general custom in Münster; for the partly very imposing and richly ornamented houses of the citizens, that stand on other streets of the city, exhibit enclosed ground stories, like those of other north German cities. Usually in Münster and especially in the houses with porches of the "principal market", the entire lower hall is treated as an undivided shop; behind it then follows an independent room with hearth. Yet this is indeed a later alteration, based on the modern arrangement of the business in the shop; also the very common addition of a third rear room, which is so much narrower, that the hearth room beside it still receives light from the rear facade, is certainly a later addition.

140. Houses at Brunswick.

The German houses treated heretofore all have their gables toward the street. The form and mode of construction of the house are differently treated, where the eave of the roof is usually turned toward the street; but the internal subdivision remains almost unchanged. The Nagd House at 9 Langenstrasse

in Brunswick, represented in ground plan and section in Figs. 154, 155 [138], is an example of such a design on a lot wider t than deep, and it already dates from the last division of the period to be described here, when the first Renaissance forms began to mingle with the Gothic basis of the construction. But its erection is fixed in the year 1533 by an inscription cut over the doorway. Yet we find extremely simple conditions. In the lower story of the house a great hall occupies two-thirds of the house; aside from a shop room evidently cut off later in very simple shape, there is arranged beside it only one room, over which in an inserted half story is formed a chamber. The stairway lying behind the room, likewise rebuilt in the time of the late Renaissance, permits access from the hall to the upper living room and to the higher stories. These are a arranged throughout as storerooms for goods, being externally indicated as such by louvres, which naturally does not prevent separate sleeping rooms from being occasionally cut off from these wide rooms.

Note 138. From Pfeifer, H. Die Holzarchitektur der Stadt Braunschweig. Pl. 3. Berlin. 1893. (Also in Zeits. f. Bauw.)-

A great windlass, to which corresponds the necessary traps in the floors, enabled the direct transportation of the goods to and from the storerooms and the traffic room in the hall, or hoisting them from the street through the external louvres to the storerooms. For the sake of the traffic in goods, the doorways of the hall are so large, that with a height of 12.1 ft., the entrance of a loaded wagon is made possible. The location of the original hearth is unfortunately no longer evident. It probably occupied in the hall the place of the shop mentioned, and was sacrificed to the arrangement of that. At the rear wall of the shop a stairway with inclined door hinged at top leads down into the cellar. That the unpretentious mode of living in the latest mediaeval period here evident was not based on the poverty of the owner, is also manifested here by various indications. Thus shows the arrangement of three storerooms for goods over each other, while many similar houses were contented with a single one, so that the house was occupied by the possessor of an important commercial business, and

the luxuriant carving covering the surfaces of the half timber proves that this traffic produced rich exteriors.

This sort of house plan does not stand as a disconnected and injudicious remainder from ancient times,beside the later development, but it passes gradually through numberless intermediate steps into the forms of the later mode of living. As an example of how from such a spacious house with small living room was developed the ground plan of the yet somewhat later House in the Knochenhauerstrasse (Butchers' Street) in Brunswick, built in the year 1543 (Figs. 156, 157 [134]). It was indeed less devoted to commercial uses; in any case it also served for the needs of a limited agreculture, indicated by the a arrangement of the court with its stables.

Note 134. From Pfeiffer. Pl. 1.

Here the hall is much less important. Its entrance is reduced to a moderate doorway of over 6.6 ft. wide by 8.2 ft. high; at one side wall as well as at the rear wall are arranged in two stories 6 living rooms with an independent kitches separated from them. Yet the hall still extends through both stories of living rooms; in one of the great window recesses on its street side is arranged a raised seat, accessible by 4 steps. First in postmediaeval times have these plans with large rooms been occasionally abandoned in lower Saxony, while on the wall of the hall, still free in our example, is likewise arranged a room. For then remains of the ancient chief room of the house only a narrow entrance corridor, that it would have been senseless to make two-story. Then the living rooms of the upper s story extended over this corridor on the street side, thereby attaining the tasteless arrangement of two ranges of rooms along both lighted sides of the house, enclosing between them the longitudinal corridor and stairs, only lighted indirectly.

This is both artistically and practically considered a truly wretched outcome of a great and free development commenced with simple conditions, actually regarded as a victory of later comfort and effeminacy over the rude greatness of the mediaeval conception of living.

141. House at Goslar.

Nevertheless this is only a late degeneration; in the real

the luxuriant carving covering the surfaces of the half timber proves that this traffic produced rich exteriors.

This sort of house plan does not stand as a disconnected and injudicious remainder from ancient times, beside the later development, but it passes gradually through numberless intermediate steps into the forms of the later mode of living. As an example of how from such a spacious house with small living room was developed the ground plan of the yet somewhat later House in the Knochenhauerstrasse (Butchers' Street) in Brunswick, built in the year 1548 (Figs. 156, 157 [134]). It was indeed less devoted to commercial uses; in any case it also served for the needs of a limited agreculture, indicated by the a arrangement of the court with its stables.

Note 134. From Pfeiffer. Pl. 1.

157 Here the hall is much less important. Its entrance is reduced to a moderate doorway of over 6.6 ft. wide by 9.2 ft. high; at one side wall as well as at the rear wall are arranged in two stories 6 living rooms with an independent kitches separated from them. Yet the hall still extends through both stories of living rooms; in one of the great window recesses on its street side is arranged a raised seat, accessible by 4 steps. First in postmediaeval times have these plans with large rooms been occasionally abandoned in lower Saxony, while on the wall of the hall, still free in our example, is likewise arranged a room. For then remains of the ancient chief room of the house only a narrow entrance corridor, that it would have been senseless to make two-story. Then the living rooms of the upper s story extended over this corridor on the street side, thereby attaining the tasteless arrangement of two ranges of rooms along both lighted sides of the house, enclosing between them the longitudinal corridor and stairs, only lighted indirectly.

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141. House at Goslar.

Nevertheless this is only a late degeneration; in the real

mediaeval period men acted in a different manner, even if less regularly and theoretically, but artistically. The ancient imperial city of Goslar, prominently wealthy by mining and commerce, besides plainer arrangement of the hall, contains a considerable number of houses with richer subdivision. We give here the House at 11 Frankenberger St.[135] as a characteristic example , how by the gradual subdivision of different parts an entirely composite ground plan is formed from the simple hall type.(Fig 158). The principal room of the house, chiefly belonging to the late Gothic, is formed by a great hall, through which leads a passage to the court. In its rear, originally standing free in space after the ancient custom, but now separated by a thin partition from a separate kitchen, is the place of the house hearth. Beside this a stairway leads down to the cellar. On the right side -- first in the Renaissance period, judging from the forms employed -- are arranged two rooms, the rear one projecting considerably into the court. Between them lies a narrow stairway inclosed between the walls. It 1 leads into the upper rooms, that extend above the two rooms a
152 and the passage, while the hall extends up to the storeroom. We then see a part of the building in the great room, heretofore new to us, that on the left of the court irregularly projects into the plan. It must be the oldest portion of the house and date from a time, when all else was still constructed in half timber work. Such portions of buildings enclosed by heavy masonry under various names (stonework, stone chamber, stone house, tower, fire hall, warmed room) have frequently been added to dwellings constructed of wood, in order that in the usual fires by which the cities were visited, an assured place of refuge might be had, especially for the more valuable equipment of the house. It is easily intelligible, that this interior was developed into the most important room of t the house. They are proved already about the year 1200 by literary evidence, and are also abundantly preserved. Regularly as in our example, they possessed a vaulted cellar, that rose about 3.3 ft. above the floor of the hall; over this we chiefly find only one and more rarely two stories. Not seldom are these stone rooms, as in our example, constructed within the

main hall, or at least are attached thereto. Perhaps the latter was also formerly the case with the stone structure from Goslar, that we represent in Figs. 159 to 163 [136] as one of those best preserved, and that now stands detached and almost recalls the living tower of noble families. It is but modest in its dimensions, but is treated in the vaulted upper story with the comfortable and dry richness, preferred by the late Gothic workmanship of lower Saxony; it likewise still contains the remains of the original decoration in colors.

Note 135. From Wolff, C. Die Kunstdenkmäler der Provinz Hannover. II. 1, 2: Stadt Goslar. p. 327. Hanover. 1901.

Note 136. From Wolff. p. 348.

142. Kromschröder House at Osnaburg.

As a last example of the arrangement of a later time, by which these old houses with halls must be adapted to the more developed conditions of living, may be mentioned the Kromschröder House in Osnaburg. It likewise exhibits the endeavor for obtaining more room with the progressive closeness of buildings as well as for greater security against fire. Fig. 164 [137] gives the plan of the second story. While the house in general still consists of half timber work, the enclosing walls next the neighbors are built of heavy split stone masonry; at t the rear of the house is attached a "stone building" of the k kind just described, as an independent part of the structure. The division of the rest of the plan into rooms is also notable.

Note 137. From Schulte, F. Bürgerhäuser in Osnabrück. Zeit. für Bauw. 1894. p. 498.

In a peculiar way the hall was transferred to the rear, while the street side in two stories, together corresponding to the height of the hall, was occupied by living rooms. Only in the ground story is left free a passage to it. The hall is lighted at the right rear corner by a pair of wide windows, looking on the neighboring court. It contains the hearth built in an alcove, with a dining room and the stairway with galleries connecting with the upper rooms. At its centre is placed the windlass, that had to serve for hoisting and lowering the merchant's goods to the storeroom and cellar. Beside it and separated by a thin partition also in the ground story is a badly

lighted dining room, with a maid's room in the intermediate s story, and thus this house also supplies an example of how the old plan with a great hall was gradually absorbed by the separation of additional rooms.

143. Cologne. House near Church of S. Peter.

If we pass from the lower German interior regions to farther westward, to the art famous Rhenish cities, then may we assume from the beginning a more advanced mode of building at this e earlier seat of civilization. And in fact already in the 13 th century the dwellings by their entire appearance stand on a higher plane; particularly in them stone construction has already passed into a far higher development. In "holy"Cologne are or rather were preserved for us indeed the oldest monuments of these wealthy citizens. From Boisseree [138] we still have at least drawings of the heavy gabled House (Fig. 165), that stood near the Church of S. Peter. With all the earnestness of the flat ascending mass of the wall, it has rich ornamentation in the columns of the grouped windows, and in comparison with the houses heretofore described, it surprises us by t the strong isolation of its elevation, kept as symmetrical as possible.

Note 168. Boisseree, S. Denkmale der Baukunst vom 7 bis 13 Jahrhundert am Niederrhein. Munich.

Regarding the internal subdivision, we may easily conclude from the arrangement of the windows of the ground story, that the well known arrangement of a great hall also existed here in combination with a separate office for the merchant, whose location is indicated by the windows enclosed by a triangle at the left end of the facade of the ground story. The upper story may here very well have been the undivided room of a great soler; it is indeed more probable that also here separate apartments were divided from the upper part of the great hall.

Similar conditions for a slightly later time are also shown by the somewhat narrower House on the Altmarkt, that unfortunately was mutilated and was rebuilt for the arrangement of a pharmacy in the ground story.[139] We may regard it is typical for conditions at Cologne in the 13 th century.

Note 139. A representation of the former condition may be

found in "Köln und seine Bauten" etc. p. 114.(Fig. 90).

Such a house presents in its attic a considerable number of rooms, like the lower German houses first considered; but its arrangement was no longer suited to the later conditions of commerce in Cologne. To the formerly usual articles of mediaeval traffic was here added wine as a product of predominating importance, for which Cologne formed the chief place of deposit. The wine trade requires spacious cellars; therefore for the merchant's house in Cologne the arrangement of such was combined with the plan of a great hall; to this was inserted quite regularly there a second story serving for living purposes, recognizable externally by great and high windows, between the lower hall and the upper stories utilized for storerooms for goods.

144. Cologne; Houses on the Filzgraben.

An entire group of such houses, the middle one of which was a little changed by the later addition of a Renaissance gable, is represented in Fig. 166 [140]. They already exhibit all the peculiarities of Cologne houses on the exterior. Characteristic for the entire group on the lower Rhine is the constant e employment of rectangular windows with stone crosses, as well
155 as the strong opening of the second story by great openings for light and the use of wrought iron beam anchors to animate the facade. Such anchors occur outside Cologne, particularly in the Netherlands and also in many of the Hansa cities on the Baltic Sea influenced thereby. They continued beyond the middle ages, were generally richly ornamented, in order to give thereby the name of the owner or the date of erection. Characteristic for the treatment of Cologne architecture is also the battlement cornice of the house, whether it enclosed the base of the roof and the narrow gutter arranged there, as here and on the Etzweiler House, or that it followed the edge of the roof in the form of a gable with small steps. According to t the frequently repeated statements, we need not see in it actual arrangements for war, but can regard it as a favorite ornamental motive. Peculiar is then the frequently recurring motive in Cologne, instead of one great roof, the building of t two smaller parallel roofs beside each other, such as shown by

the house on the left in our group. There is less space afforded to the attic than in a great gable roof, but men helped t this rather by the erection of another story for a storeroom, since they avoided the predominance of horizontal sky lines, that resulted from this arrangement of the roof.

Note 140. From Köln und seine Bauten etc. 'Fig. 90).

The internal arrangement of houses, even if not untouched, has yet remained recognizable in everything essential in the mediaeval sense. Our source [141] describes it as follows in accordance with the previously mentioned north German houses.

Note 141. From the same. p. 114.

At the side a great gate or doorway furnished with light above and for hauling in goods, before it in the interior the door to the log stairway, over the lintel the so-called "head" with two iron teeth for holding fast the inclined beam with t the wheel for the cask rope; beside it a small portal for the entrance of the occupier and his visitors, above being great windows, on the right a small low shop or office with a gallery and a so-called suspended room, living rooms for the servants in the business and also often for the family. At the rear wall of that hall of about 18.0 to 19.7 ft. high was found a doorway to the court, also to a kitchen and the great doorway to the salon, the living and dining room of the family, reception room, also 16.4 to 19.7 ft. high and with a beam ceiling, also frequently richly vaulted with columns (for example the Zabach House in the Sternengasse [142]); in the angle at the end of the house corridor being found as a rule the generally wooden, convenient, often very artistically treated winding stairway with carved posts. A hoisting shaft connected the rooms of all stories, the first one of which still partially served for living purposes, while the others chiefly contained store and packing rooms, that also were supplied by a hoist above t the projecting beam. Behind the rooms extended a broad gallery to the attic storeroom. All windows were grated next the street and the court, at least in the ground story, and were frequently closed by strong iron shutters.

Note 142. Commonly, or we might say regularly at first, this salon was found in the second story of the house, instead of in the addition here described next the court, as in Bremen.

145. Cologne; Etzweiler House.

Larger and more imposing is the Etzweiler House, that occupies the corner "Unter Taschenmachern" (Under Pocket-makers.). (Fig. 167 [143]).

Note 143. Reproduced from Köln und seine Bauten etc.

It is approximately square and is again covered by two parallel roofs. At the upper corner of the house and after the model of the Gürzenich, but in much more graceful proportions a are three octagonal bay windows, corbelled out on small columns and adorned by tracery. Between them on our representation and according to the same prototype (Art. 182; Fig. 228) is g given an ornamental battlement cornice, that on the house itself is replaced indeed by a later straight wall. The street corner is further characterized by a statue of the Madonna, beneath a slender ascending canopy, a decoration that everywhere and in all artistically active times in Germany formed a favorite ornament of houses and streets. At the right corner of our elevation and high above an apparently enigmatical large corbel, similar to those found on other houses. This is explained by the adjacent house, a considerably lower house furnished with a gable. This without doubt, as frequently a custom in Aix-la-Chapelle, had a projecting gable, that rested on this corbel.

Of the upper stories of the house, we must regard the highest with its nearly square windows with stone crosses as a storeroom story, whose hoisting beams still project on the side elevation. Beneath it follows the chief living story, that first of all received the previously mentioned salon, and beside it perhaps also some sleeping rooms. The high lower story separated by a small belt has recently been rebuilt with great show windows. We do not follow in our reproduction the representation given, since we may not assume, that in such an important house were built open retail shops. With reference to Fig. 166 and to the given discription of the passage in the p plan, we extend this lower story, so that in the middle the great doorway and a great and high window with stone cross denote the location of the great hall of the house. On the right and left thereof we assume the separation of smaller rooms

with intermediate stories, into one of which again extends the entrance to the cellar, furnished with log stairs and "head".

146. Dutch Citizen's House at Edam.

Very peculiar and clear again an old Dutch citizen's House [144], published by Mühlke, shows how a later time adapted the single great hall to its own views by divisions. The House (Figs. 168 to 170 [144]) is located in Edam, and has a narrow and deep form, turning its late Gothic brick gable toward the street.

Note 144. From Mühlke, K. Streifzüge durch Alt-Holland. D Denkmalpflege. 1904. p. 26 et seq. -- Also by the same author;- Von nordischer Volkskunst. Berlin. 1906.

The ground plan (Fig. 170) shows us the high front hall extending the entire width of the house and well lighted by the great windows of the facade. From this at the right side a narrow passage leads to the court, on which lie the middle two story portion and the rear chamber also extending the entire height like the hall. The two story middle part is sunk with its floor about 2.6 ft. below the remainder, in order to obtain sufficient height for two stories.(Fig. 169). Its lower room has a hearth and is in direct connection with the small cellar, and serves as kitchen and dining room of the family; the intermediate story is divided into two upper chambers, furnished with fixed masonry bedsteads, and is thereby indicated as the sleeping rooms of the family. Each is reached by a separate stairway. Another fixed bedstead is also constructed in the rear hall. The cross section of the house (Fig. 168) shows how by the utmost possible arrangement of window surfaces, pains were taken to fully light and ventilate these middle rooms; it also shows the hall-like form of the front of the house, as well as the apparently undivided upper story. Notable is also the treatment of the framework of the roof on account of its relation to the great hall of the early mediaeval Imperial Hall at the Hague, given in Fig. 64. The whole is indeed substantially ornamented by additions and equipment of a later time, but its nucleus is still purely mediaeval. It affords the most valuable support for the mode in which we can conceive otherwise the addition of sleeping room and cots.

147. Citizens' Houses of Northern France; Amiens.

Similarly as in the west of Germany in the rich commercial

city of Cologne, there are also in the north of France richly treated stone houses already remaining from a relatively early time, houses that may be regarded as the dwellings of well to do citizens. Unfortunately all statements relating to their arrangement are wanting; but the illustrations of them in our possession allow u. to recognize, that the part of the building next the street, differing from the German examples last mentioned, were not arranged for the reception and storage of goods. It is there conjectured that the entire commercial traffic was transferred to the court. As an example may serve a House (Fig. 171[145]), that stands in S. Matrin St. in Amiens, where indeed, as for so many German architectural monuments, the ground story is not preserved in its ancient form.

Note 145. From Viollet-le-Duc. Vol. 6. p. 324 (Fig. 9).

In case the form drawn by Viollet-le-Duc be correct, it contained a wide doorway to the court, that was also adapted to separate the wagon traffic with the merchant's goods from the other business of the house. Besides this remained in the ground story only one room of moderate dimensions. What the two upper stories contained is not apparent. Judging from the abundance of stepped windows decobated b: columns, both stories served for living rooms. Above rises in artistically well calculated contrast the plain gable only enclosed by its fine coping, with but a narrow window opening. If the roof contained a storeroom for goods, then must it have been accessible from the court by hoisting windows, such as are usual on the facades in Nuremberg.

148. Southern France; House at S. Antonin.

Similar architectural conditions, only more like the southern, are presented by the House mentioned by Viollet-le-Duc from the little city of S. Antonin.(Fig. 172)146).

Note 146. From the same. p. 228.(Fig. 8).

It opens from the market place in the ground story with a p porch having three openings with pointed arches; the second a and third stories each have a series of 8 pointed windows, alternately separated by piers and columns.

Like so many others, it contains in the interior, which has been preserved, a great business room or storeroom for goods

in the ground story; above this in each story was formerly a great hall, adjoining which in the rear was the stairway and a smaller room. Likewise there are wanting all arrangements for the hoisting and storage of large quantities of goods, just as commonly occurs in the houses known to us in southern countries (Italy and Spain). This may have its reasons, that in these countries with an earlier developed financial traffic, the wholesale commerce was less concerned with bulk goods, than in the north, or that men were accustomed to build the warehouses separate from the dwellings.

149. Citizens' Houses in middle and southern Germany.

Again a different picture appears to us, if we turn to the prowinces of middle and southern Germany. A more refined civization based on the earliest traditions there did not permit the rude mode of living in north Germany with its high and wide halls. On the other hand, the climate made it necessary f for better protection from injury by the cold of winter, than was required in sunny southern France. Also here the house indeed at first formed a single internal rsom; yet in the 14 th century is it proved, that the wooden houses of the citizens of Munich, which were designated by the name of "one room house", extended to the roof without any subdivisions. But beside this proceeds a tendency toward a greater subdivision of the entire space.

While men in the north were satisfied with some rooms and s sleeping chambers parted off in the great hall, but left the centre of living with the house hearth in the ground story, if the available space allowed this anywhere, men here strove very soon to thoroughly transform the ancient house of a single room for the requirements of comfortable living. Already early here for the city house the important arrangement of a "solar" or entire upper story is proved by literary evidence [147] to be the place in which men were accustomed to eat and to rest. It also bore the name of hall or summer house, and may be regarded as an originally undivided room, that was without any arrangement for heating or a fireplace, judging from the last appellation.

Note 147. See Heyne. p. 221.

Thence it would follow, that the house hearth at first retained its place in the lower story, so that this also further f formed the chief room of the house. But in a structurally undivided upper story men might be quite comfortably arranged by cutting off some parts by hangings or by light wattled partitions, and thereby easily adapt it to the changing requirements of living. In this way might such plain structural plans remain to a later time. Houses in which such an undivided upper "summer house" is still recognizable, may still be found in s some examples at Erfurt, Treves etc.

150. House in Erfurt.

We give in Fig. 173 [148] a view of such a building standing in Allerheiligenstrasse at Erfurt, that by an inscription on the beautiful bay window is dated in the year 1429. The ground plan forms a simple rectangle of about 65.6 ft. long by 39.4 ft. wide.

Note 148. From my own photograph.

To the great entrance doorway 11.5 ft. wide corresponds an equally large exit to the court; on the right of this driveway, where indeed was formerly the heath plade, is a room and a stairway evidently built later. In the upper story, now subdivided by all sorts of modern partitions, may be seen two carefully treated octagonal posts built in these walls, which originally stood free in the room and bore the longitudinal g girder by means of elaborate cap timbers.

151. Schweitzer House at Neustadt-on-Orla.

Yet for the later time the construction of fixed walls in these great rooms forms the rule, wherein men commenced with the separation of a row of rooms on the side next the street. At some time, at least among those more well to do, it became insupportable to the increasing feeling for comfort and for a more secluded family life, to retain the chief apartment of t the house and the hearth place in the open room of the ground story, where at each opening of the house door admission was afforded for wind and air currents, as well as to the view of strangers passing in the street. Very little relief, and many inconveniences for home life resulted, when the hearth was enclosed by a slight partition and perhaps beside the kitchen t

thus cheated was also arranged a room, about as the lower story of the Erfurt house just described, that exhibits it as a later arrangement. But as a rule men went further and placed the h house hearth in the great upper hall, where it also stood free at first, as it was formerly placed free in the lower room. T The late Gothic Schweitzer House at Neustadt-o-O dates from t the year 1551, and gives a good representation of such a house, even already quite comfortable according to modern conceptions. (Figs. 174, 175 [148]). Corresponding to the increased requirements of the late period, it even exhibits two stories of living rooms above the ground story. The upper one of these is thus distinguished by a bay window extending into the attic, and was formerly crowned by a high pointed spire, in the interior being covered by a graceful small star vault. This third story may therefore be regarded as the most important residence story of the house, though also in the lower story is found a wooden ceiling of inserted boards with richly moulded beams.

We give its plan in Fig. 175. The great hall or "summer house" therein still far exceeds the other rooms in extent. Only on the street side extends a row of three rooms, the middle one being characterized by the bay window mentioned and by a richly treated beam ceiling. At the rear of this series of r rooms and on the left lay the hearth, that originally stood in the hall, even if it be now with some chambers separated from the hall by thin board partitions. At nearly the middle of t the hall ended the stairway ascending from below, while in the rear corner at the right a smaller stairway led up to the attic. Thus this hall afforded a spacious room, splendidly suited to gather the entire family around the hearth in a common life, while the separate chambers could partly serve for festal occasions, partly for sleeping rooms. Along the court side of the house extends a broad open gallery, affording access to the privies located there. Such a division of the house into two parts, a front row of living rooms and a rear hall, in which stood free the hearth and the stairway, is very common and especially in middle Germany. It is found toward the north even to the Westphalian frontier, and there meets with the north

German house with a hall of the kind previously described, for example in Minden. It likewise extends over the lower Eichsfeld (Duderstadt, Northeim etc.), where it entirely predominates, as far as Brunswick, and also there maintains a not unimportant part beside the north German type of house.

152. Merchant's House in Nuremberg.(On Dürerplatz).

When men had once progressed so far in the separation of the living rooms, then it lay next, especially on a restricted site, to thereby create other needed rooms, so that also the rear of the house was utilized for the arrangement of separate rooms. But in better times a portion of this rear part always remained free, and at least in the form of a lighted corridor served for lighting the hall. An excellent example for representing this mode of living is given by the beautiful late Gothic House at 1 Dürerplatz in Nuremberg, whose form of ground plan is repeated a hundred fold.(Figs. 176, 177 [149]).

Note 149. From my own drawing.

It possesses in the ground story a great doorway, leading i into the open hall. From this is only cut off a small office in the front corner on the right; the interior is otherwise undivided. On the left of the entrance doorway was still located a few years since the great scales for weighing the bales of goods. The stairway to the upper story lies at the outside in the court, according to primitive custom. It was rebuilt in the Renaissance period and for greater convenience, it was then extended by a branch terminating in the court. At the rear of the court lies a small wooden stable. Thus in all essentials the ground plan is almost exactly similar to the north German example given in Fig. 151. On the contrary the upper story is thoroughly different. It is reached by means of the open court portico and the stairway already mentioned, and it contains two front rooms, grouped around the remnant of a hall, together with a room or kitchen next the court, as well as a chamber and the stairway leading upwards. The exterior is constructed of massive ashlar masonry and is on the whole plain; but the bold mouldings of the pointed-arched entrance doorway and a graceful bay window in the second story animate these surfaces. On the contrary the roof is treated in the

most animated manner by the richest development of carving on its main part.

153. Merchant's House in the Bergstrasse in Nuremberg.

In such a house the upper stories could already be utilized as needed for living purposes or for storage rooms; yet sufficient care was not yet taken for a greater traffic. An excellent example may serve as a type, how the merchants created great storerooms for themselves in the animated increase of commerce, but at the same time gave their houses a certain adaptability, i.e., so arranged them, that alterations and changes could easily be made, has remained in Nuremberg. We give its representation on the adjacent plate and its description in von Essenwein's words. It is the House at 7 Bergstrasse, that in the decades from the middle of the 19 th century onward, when all alterations were undertaken, belonged to a friend of art, who made it his pride to leave it in the condition, in w which he had purchased it about the middle of the century.

The plan of the 15 th century in all parts was still clearly preserved; excepting at about the change from the 16 th to the 17 th century the old rooms had been furnished with new wainscotings. Perhaps also some walls were then first inserted new, but which, if needed earlier, might have already been added in the 15 th century; for what we have already termed adaptability means, that without affecting the nucleus of the house, any walls might be added or removed, and that in the entire house not a single structurally necessary internal wall existed. A little decorative ornament in the corridor, a slight alteration in the stairs, that occurred in the 18 th century, changed nothing in the character, and even if the earlier owner before our art friend did something each year toward "beautifying" t the house in accordance with his modest means, i.e. papered a room or had an old paneling varnished, or had some wainscotings removed and the walls plastered, still the last owner was so much the more conservative, thus being an avowed enemy of the architect and to all work of restoration, so that nothing in the house must be changed, except perhaps the removal of some papers, with which the former possessor of the house had beautified it. For sake of cleanliness also, as he said to the

architects, he usually admitted some of their "colleagues" to his house annually, i.e. some whitewashers, in order to have white-coated anew the parts of his house, that had been whitewashed from ancient times, whether these were so coated from the beginning or first in the 18 th century, yet he liked to preserve in certain parts of his house his spiders and never permitted the removal of the dust, so that his house always retained the impression of untouched antiquity. Yet times change; he died, and what he had most feared occurred; his house passed into the hands of an architect, who modernized the entire internal arrangement, so that now for several years it has yielded a return corresponding to its capital value. Yet this new owner fully understood what he must change for this purpose. The most beautiful wainscoting is now in the Germanic Museum; he knew how to utilize others again, and before all he made accurate drawings of its condition, from which our representations were drawn.

The house consists of two entirely separate buildings; a front house lying on the street and the rear house separated therefrom by a court. The front house has a cellar beneath it, the entrance to the cellar being from the street at the corner of the house. Only a structure in the hall, to which a stairway leads from above, in the corner on the left of the observer, recalls the cellar in the interior. This structure forms a sort of gallery, on which sat an employee of the merchant, who could record the merchant's goods sent out and received. If a festival were held in the hall of the house, the musicians sat there. One window, that opened on an alley from this gallery, may have originally existed; the other three did not belong to the original design. Otherwise the entire ground story was at first one great hall with entrance doorway in the facade, to open into the court. Great cslaes on the wall, hanging on a great movable arm permitted the weighing of the largest and heaviest bales. In about one-fourth of the hall was later constructed a vaulted room, in which special goods could be stored.[150] A wooden winding stairway led upwards. The court could also be filled with wares; it contained in the division wall next to the neighboring house a draw well common to both.

Note 150. According to the proportions of other merchants' houses in southern Germany, for example, of the one on the DΞ-rerplatz just described, in which similar separated parts of the ground story manifestly served as a writing room for the master or a bookkeeper, as well as by reason of the similar plan prevailing in north Germany, one may indeed also see in this vaulted room rather a small office.

The rear house was divided lengthwise into two parts; one was vaulted and either served as a stable for horses or for storage of special coods, the other as a passage to a rear court, that occupied the width of the lot, and which could be l laid out as a small garden, as it was for a long time, if the space was not also occupied by the business. A straight stairway led upward in the rear house. The hall did not have the height usual in Cologne; on the other hand the entire second story was evidently likewise intended for the business, and a hall in the front house next the street side was separated from the remainder by a frame partition, that could easily be removed, and this occupied the smaller half of the second story. Therein was the writing room of the merchant, who indeed had numerous assistants; the hall itself must have been no further divided in this story, where employees and strangers transacted business; yet the age of the partition walls could not be determined, and thus they are reproduced in our drawing, since the merchant indeed always needed a number od separate rooms for special goods, particularly in the vicinity of the counting room for samples of goods. In the room beside the stairway had long been a kitchen. A light wooden open gallery represented the connection with the rear house, whose second story was originally an undivided room with a great post in the middle. Yet walls were already early introduced; for the three rooms thus formed bore wainscotings of the 17 th century. In the third story of the front house was the dwelling of the family, whose largest room had the extremely beautiful wainscoting, t that is now found in the Germanic Museum. The two smaller rooms served as sleeping chambers; the room beside the stairway may have been the original kitchen, so that the table may also have been set there in the hall. The rear house was also conn-

connected in this story by a light gallery, and it remained to the last as a single wareroom with a wooden post at the centre. So far the beams lie the shortest way in the front and rear buildings. In the uppermost story they lie lengthwise and in front are supported by two girders, in the rear house by a single one. A connection between front and rear buildings no longer exists in this 4 th story; the girders are weak, and thus it appears, unless a very great transformation occurred, as if walls were originally arranged in the rear house, rooms being found there for the employees. Also in the front house, the two rooms next the street must originally have been the dwelling of the children. The attic has five stories in the front and four in the rear house; yet only three were used as storerooms. Hoists from the street for the front house and from t the court for the rear house are indeed later, but are merely the successors of the earlier ones; for by hoisting the goods injuries must occur to the apparatus, which then made frequent renewals necessary.

In contrast to the Merchant's House in Cologne, in Nuremberg, where all the merchants' houses lay on wide streets, the goods could be hoisted from the street without disturbing traffic. But a contrast to that in Cologne also consists in the utilizing of the roof, that was built as high as possible, and therefore the gable was not across the narrow end, as would have been natural, but on the longer side. Men required in Nuremberg more storerooms in the house, since there great public warehouses could not receive a part of the goods.

The external architecture of one example is the simplest conceivable, like such houses in general. The facades are entirely of plain stone, both next the court as toward the street, and indeed of those extending through the entire thickness of the walls, there merely of headers. The doorways and windows are simply cut out of these walls, excepting that the facade also exhibits merely a projecting cornice. Only the simply profiled main cornice, on which are generally laid three to five courses of bricks, terminates the facade. The horizontal rafters of the roof project beyond this. The entrance gateway is enclosed by a somewhat richer moulding; the windows are di-

connected in this story by a light gallery, and it remained to the last as a single wareroom with a wooden post at the centre. So far the beams lie the shortest way in the front and rear buildings. In the uppermost story they lie lengthwise and in front are supported by two girders, in the rear house by a single one. A connection between front and rear buildings no longer exists in this 4 th story; the girders are weak, and thus it appears, unless a very great transformation occurred, as if walls were originally arranged in the rear house, rooms being found there for the employees. Also in the front house, the two rooms next the street must originally have been the dwelling of the children. The attic has five stories in the front and four in the rear house; yet only three were used as storerooms. Hoists from the street for the front house and from t the court for the rear house are indeed later, but are merely the successors of the earlier ones; for by hoisting the goods injuries must occur to the apparatus, which then made frequent renewals necessary.

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divided into two parts by vertical mullions, are merely treated with a cove. Stone crosses do not occur with the low heights of stories in Nuremberg, only divisions by vertical mullions. The gable walls and party walls between two neighbors a are built of bricks.

154. Other Houses in Nuremberg.

Just like the house mentioned here, the others also stood p plain and upright on the streets, without therefore appearing eccentric; for here and there a charming addition enlivens the view, making a particularly fine effect on the general and quiet background. Sometimes a graceful little apse projects from the surface; sometimes at a corner stands a figure beneath a canopy; sometimes is the roof enriched by additions at its corner or on its broad surfaces, that first of all improve t the outline of the entire mass. Especially valuable for the animation of the street view is it, that in mediaeval cities one house commonly projected so far beyond the next house, that still one or even several windows could be arranged at the side, as may be seen on the adjacent Plate. In the second story is there a window and a little apse; in the third story a are placed two windows. In the fourth story is but one, but there is a recess in the wall of the hall, that makes possible a slot window, which permits from the hall a view toward the street. There also projected a portion of the great gable over the neighboring house, and the animated architecture of this gable uncommonly improved the street. The lower part of t the projection of the house was built of ashlars as far as to the height of the cornice, corresponding to the facade; but in reference to the brick masonry, that behind separated the house from that of the neighbor, and brickwork became common for this gable. It was built with piers closely adhering to the north German style, between which are plastered recesses, that show openings so far as they project above the roof, with connections above and extending from pier to pier, so that here also again appears the stepped gable. Since the example selected by us no longer retains its ancient gable, we give in Fig. 178 that of the house adjoining the City Hall in Theresienstrasse, so far as we know, as being the best preserved among the

many mutilated ones remaining, that also still show the painting of the plastered recesses with red and black joints on a white ground.

155. The Schad House in Ulm.

Likewise consisting of a front and a rear transverse house is the Schad House in the Hirschgasse in Ulm.(Fig. 179 [151]). But a number of additions are connected therewith, characterized by the later date of its erection and also by the higher rank of its merchant owner.

Note 151. From Gurlitt, C. Historische Städtebilder. Ulm. Berlin. No date.

The massive vaulted corridor of the house is wide enough to receive the straight stairway ascending to the upper story beside the passage to the court; on the right and left of it lie vaulted warerooms, and the writing room of the owner projects into the court like a bay window. The court is enclosed by wings on right and left, which contained stables and other subordinate rooms; wooden galleries in two stories extend along these and connect the front building with the transverse wing in the court. This contains in the ground story again a massive vaulted hall with two piers, that likewise formed a great warehouse. In the upper story the stairway of the front house terminates in a great anteroom, adjoining which are the kitchen on the left and living rooms in front and on the right. T The wings alongside the court serve for sleeping rooms and servants; the transverse building contains the great festal hall of the house. From this leads a passage through the corridor beginning on the left to the garden, that extends behind the second court in a somewhat elevated location. Thus in the entire plan the important and brighter side is much more strongly emphasized in comparison to the more mercantile and plainer side of the preceding example, and this important nature is a also expressed in the treatment of the whole. The court possesses more richly constructed galleries; a portico with a beautiful fountain, added in 1627, adjoins it in the rear; likewise the anteroom of the upper story still retains its beautiful c paneled ceiling. Already standing in the Renaissance period, the whole forms a closing member of the evolution from the sim-

simple conditions of the citizens.

156. House Types on the Basis of several Floors.

These already very extended south German house types also a according to the preceding are clearly to be derived from the ancient German hall-like house of a single room. But besides them occur in the extreme south, southwest and southeast Germany a series of house forms, that do not permit such a derivation. These are buildings, whose irregular division of the interior avoids all reminiscences of the ancient type of the great hall. Their location on the frontier and the fact, that they almost entirely belong to a later time, permits the conclusion, that we may refer them to the influence of foreign house forms. As a model for them served in the south and southeast the house of the Alpine lands, that in the high mountains, more withdrawn from direct German influence, permanently retained the antique tradition of a plan containing serveal rooms. As an example of its architectural style may be compared the small nobleman's seat near Klausen described in Art. 84. In the southwest and especially in Alsace may it be assumed indeed, that the smaller French castles and manor houses exerted an influence upon the building customs of the well to do citizens. Opportunity for employing skilled artizans was so abundant, that men were accustomed in their picturesque little cities, so charmingly located on the vine-crowned hills of the Vosges mountains, to erect houses for themselves, that occupied a middle place between a nobleman's seat, the house of a well to do vine cultivator, and the city style of building.

157. House at Reichenweier.

From the remains of ancient domestic magnificence over abundant in the little city of Reichenweier, we bring as an example such a dwelling in Figs. 180 to 182.[152] After the manner of a nobleman's court, it is separated from the street by a court enclosed by a high wall; but its lower story served entirely for the business of wine culture, as it contains only two rooms; a cellar hall with a wide archway and a cellar, such as frequently occur in Alsace as fermenting and storerooms for wine, slightly or not at all sunk in the earth. They correspond indeed to the idea of the ancient cellar, but scarcely to

what we elsewhere understand by a cellar. From the cellar hall one ascends by a winding stairway of stone, a regularly occur-
109 ring appendage of these houses, to the upper story, in which kitchen and chambers adjoin a small corridor. The main room with a bay window has a finely paneled ceiling. On the exterior prevails a plain treatment of the forms; only plain mouldings and simple windows with cross bars animate the surfaces. Yet a pleasing effect is produced by the fresh alternation of the various openings and the projection of the stairway tower and the bay windows with small outlay for forms. For the stairway tower we have assumed in our drawing a crowning by a tile roof, corresponding to the plain treatment of the whole. Besides such solutions for these are also found the arrangement of a small terrace enclosed by a graceful tracery balustrade.

Note 152. From my own drawing.

153. Sufo House at Ueberlingen.

Farther south in the extreme corner of the present German e empire the so-called Sufo House in Ueberlingen forms a very ancient example of this kind.(Figs. 153 to 155). Whether it actually was the habitation of the learned mystic Sufo, living in the first half of the 14 th century, may be uncertain, in spite of a local tradition. The detail forms of the stone facade wall lying next the street afford no very assured basis for determining the date of its origin; in any case the building belongs by its age and the peculiarity of its plan to the most notable dwellings of the German middle ages. Aside from the many additions and restorations of recent times, there results a tolerably simple ground plan.

In the ground story one enters through a round-arched doorway surrounded by a fine cavetto, above which is placed a representation of the Crucifixion, into a hall paved with stone slabs. In it the hearth lies in the rear, in the middle of t the floor is a trapdoor for entrance to the cellar; at the left of the entrance doorway a stairway leads to the upper story; in the right hall a round-arched doorway opens into the chief room of the house, a chamber about 14.8 by 22.0 ft. Another small room adjoins the rear wall of the entrance hall; it is not impossible, that its projection beyond the line of the

large room may have resulted from a later rebuilding, since t the entire rear side of the house, that on the sloping site extends about one story lower than the old main facade, has experienced important alterations in later times. Aside from t the enclosure of this projecting room, all walls are erected in masonry of considerable thickness. On the contrary in the upper story only the front and gable alone were of stone; all else is simple half timber work, externally effective only by the good joining of the different parts. Also here an entrance hall adjoins the stairs and also contains the fireplace, h here placed next the front wall. From the niche in which it is found , a small opening for passing the food extends into the adjacent room, which we must thus consider a dining room. Two other chambers adjoin at the rear. The whole forms a very comfortable dwelling, in which indeed only the very low story heights of 6.9 ft. in both upper and ground stories appear striking in comparison to our modern views.

159. House in Berne.

Perhaps as a continuation of the data here given may be regarded the stately House in Berne, that we reproduce in Figs. 186 to 188.[153] Berne belongs to the cities, that according to southern prototypes accompany their principal streets by continuous vaulted passages, and thereby created the most suitable locality, in which also traffic and business might be pursued, undisturbed by heat of sun or rainy weather, as well as the gay passage of the promenading important world.

Note 153. From Gurlitt, C. Historisches Städtebilder. p. 8. Bern. Berlin. No date.

Thus likewise in the ground story of our house extends the vaulted passage on massive piers, at whose rear wall open two shop rooms, of which we certainly do not know whether they always had the existing form. Probably the rooms on the right with the present house entrance formerly composed a great entrance hall, from which the shops and workshops were to be reached at the rear of the stairway to the upper stories. In this only a small corridor adjoins the stairway; all else is utilized for the plan of a spacious living room,and the kitchen is placed in the right corner at the rear. From this the usual

open passage extends to the privy located in the rear angle of the court. The whole is so arranged, that each story might v very well by itself form a separate dwelling, and since here could not be considered the use of the upper story for storage purposes, as we found common in north Germany, the house may thus have belonged with those not owning a dwelling. The exterior of the house is generally plain and made a simple impression, since still instead of the great modern windows smaller light openings appear in the upper parts of the wall. But by the addition of the effective bay window with the rich blind tracery ornament of its walls and its very developed corbelling, in combination with its widely projecting eaves of the roof, it strongly advances from the row of its neighbors and produces the expression of comfort and wealth.

160. Small House in Regensburg.

Few German cities have retained so many remains of mediaeval architecture as the very ancient Regensburg, that also after its first period of splendor, in which it was the imperial capital under the last Carlovingians, still maintained its paramount importance as an ecclesiastical, commercial and political centre of Bavaria during the entire middle ages against much younger Munich. Also after the numerous losses, the most recent times have brought to the existing condition of old dwellings, losses with which are to be reckoned the rebuilding of the old family residence of the Thundorfer family, known under the name of "Goliath's House", yet in the narrow alleys of the interior of the city besides so many remains of the Romanesque period, numerous dwellings in Gothic style have endured through numerous burnings of the city, thanks to the stone construction employed throughout on them. Unfortunately just the largest and most important of these buildings are so changed in the interior, that their ancient plans are scarcely longer to be recognized. Fig. 189 [154] gives the ground story plan of o one of the smaller houses, located at the corner of the Fischmarkt and of the Kahlerstrasse.

Note 154. From my own drawing.

It shows the plan of a wide vaulted entrance hall with a larger room beside it, likewise covered by ribbed vaults. The o-

open stairway winds around to the upper story in the angle of the court; only from that is it placed in the interior of the building. The upper stories are three in number,and each contains a small anteroom, that received the before mentioned stairway, and in size corresponds to the rear bay of the vault of the larger room in the ground story. Three rooms nearly correspond to the remaining three vaulted bays of the ground story and adjoin this. From the rear room in the second story a passage again leads to the privy located in the angle of the court. The court gable of this house with its upper stepped termination and a window lintel decorated by a cusped arch in the top story are well preserved; otherwise the entire exterior of the house is greatly changed.

161. Roritzer House in Regensburg.

In order to present for Regensburg the characteristic mode of treatment of the architecture, we give in Fig. 190 [154] the exterior of the house, that belonged to the cathedral architect Wolfgang Roritzer, and which was probably constructed by h his rebuilding two or three old houses on a larger and tolerably developed ground plan. The external walls rise with plain surfaces; the simply cut windows for the needs of the stories for living are arranged in several groups by cornices above t them; as prominent decorations serve the windows of the attic subdivided by small columns. The stepped gable of the left p portion of the house finds its continuation in a battlemented termination of the wall of the house, behind which is concealed a shed roof sloping to the rear.

162. Houses at Passau and Steyr.

In a different manner appears further the adherence to southern architectural customs, that we may see in such concealment of the crowning roof, if we descend the Danube further. In P Passau, that still possesses a considerable number of vaulted lower stories, similar in kind to that reproduced in Fig. 187, already appear the first simple examples of stone galleries around the court in several stories. This motive is thus developed in the most graceful way in upper Austria, especially in Steyr. There are arranged the lots of the full citizens around the elongated main square of the city in quite imposing widths

and very great depths. Since Steyr arose by means of its famous iron industry and by the medium of the southern traffic coming from the Alps to an important market, these lots were built over with the inclusion of several courts in a frequently extensive way, even to the rear border, that was marked by the slope of the hill or the outer walls of the city. Figs. 191 to 194 [155] afford an idea of such developed plans.

Note 155. From the publications of the Wiener Bauhütte.

We see how in the ground story the entire front is open in vaulted halls for traffic, and how in all stories are arranged beside each other rooms furnished with vaults or beam ceilings. By different stairways and the columnar galleries of the courts a and b care is taken, that almost every room may be used separately, so that according to need it may be made a storeroom, quarters for traveling peddlers and their servants, or even a living room for the owner. So we may conceive such a house as filled with a varied and noisy life; it combines in itself within small space a dwelling, bazaar and a southern caravanseray.

As a special peculiarity of the cities of upper Austria, we also find here a great use made of corbelling,. Not only do t the galleries around the court in the second and third stories project on corbels; the entire facade projects in this manner like a bay window for the height of two stories. In the interior are constructed heavy and deep piers for the loading of the corbel, between which the front wall is but thin. The windows stand between these piers connected by arches, as if in deep recesses, and they have those masonry seats beside them, which make the rooms so comfortable. In the latest examples have these piers been divided and finally replaced by columnar supports, which in a statically correct manner only load the rear ends of the corbel stones, forming a very rich motive for the subdivision of the interior. Characteristic of the art of these nearly Alpine regions is also the frequent use of heavy vaults and the arrangement of open attics resting on few supports with girders pinned together. One hoisting opening in t the lofty and at first vertical gable permits the storage of goods. Above this the roof terminates in hipped form, while it was entirely hipped in the rear, and contained an opening for the little court b.

Similarly arranged and grouped about two internal and very picturesque courts is another House at Steyr, today the offices of the Alpine Mountain Society, whose gabled facade and section are represented in Figs. 195 and 196.[156] The house has but one upper story, that is again corbelled out like a bay window. The architectural style exceeds in boldness that otherwise usual locally, and as seen in the preceding example, since the corbellings and the supporting piers do not coincide, but only straight arches on the wide spans support the window wall of the projecting story. Likewise by the rich blind tracery of the surfaces is the building distinguished above others, and it also contains in the interior in the beautiful doors, the charming stairway and the beautiful courts already mentioned, a great number of refined architectural solutions.

Note 156. Likewise from a publication of the Wiener Bauhütte.

163. Citizens' Houses in the Tyrol.

Like these houses in Steyr, so also the citizens' houses in the charming cities of the Tyrol mostly stand on deep and narrow sites, and they attain to a considerable extent by the inclusion of one or more courts. On the exteriors the Tyrolese house architecture is characterized by the preference for the arrangement of porticos, which make the architectural expression of the city so comfortable, and by the inclination to conceal the usual flat shingle roofs behind a horizontal wall, in case it is not permitted to overhang the facade with strongly projecting eaves. The very favorite and numerously employed bay windows then subdivide vertically these rectangular structural masses. Our street view from Sterzing (Fig. 197 [157]) may afford a representation of the effect produced.

Note 157. From Steffen. Baudenkmäler deutscher Vergangenheit. Vol. 1. Pl. 1. Berlin. No date.

As a special expedient for introducing light into these deep structures without acceping the inconveniences of open courts, there was developed the peculiar design of light courts, that very notable recall the elevated skylight openings, whose germ we find mentioned occasionally in the ancient German halls, a and which are also marked as "testudo" on the plan of the Mon-

Monastery of S. Gall. There are large rooms, mostly containing the stairways, located in the interior of the house, and with their external walls extend so high above the roofs, that great arched windows allow an abundance of light to fall to even the ground story.

164. Citizens' Houses in Bohemia.

Similar dwellings containing numerous rooms finally extend northwards even into the border provinces of western Bohemia, where an ancient German tradition did not oppose them. These are there often connected with the eastern custom of street porticos, by which especially the great marketplaces or squares of the cities of German colonists were frequently surrounded. But in the detail forms is there often visible an influence of the very naive and dry picturesque architecture, as preferred in Slavic lands, generally in combination with the influence of the Italian artists already attracted to the northeast by the rulers. Two houses from Wittingam (Figs. 198 to 200 [158]) and Budweis (Fig. 201 [158]) are produced here as examples. The ground plan of the first is characterized from the houses in Steyr by the clear arrangement of the passage in the ground story, but otherwise is based on the like practical tendencies, to arrange the rooms beside each other purely according to the requirements for use. Notable on the exteriors of both houses is the preference for a low inclination of the roof and the sportive use of the forms of military architecture, that we can refer to the influences before mentioned.

Note 158. From Mitt. ier K. K. Centralcommission zur Erforschung und Erhaltung der Baudenkmale.

After we have endeavored in the preceding to obtain a survey of the different forms of dwellings, that served the citizens in a narrower sense, i.e., the artisans and merchants, who furnished the"support of the citizens,"as said in the middle ages, it is time to turn to the house of that inhabitant of the city, the conditions of whose living were substantially determined by the practice of agriculture. As previously stated, it is certain, that in the beginnings of most German cities all the citizens at first belonged to that class, while by the possession and cultivation of the vacant land, a city settlement co

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could be obtained a firm support for during even unfortunate times. But one should not forget, that these agricultural full citizens of a growing city should in nowise be placed on the same plane with the peasants of the surrounding villages. Politically and socially they were elevated above the condition of such by even the small grants of the right of self government; but before all the use of the right to hold markets and to carry on commerce formed for them the chief ground for the settlement, or in the oldest and most slowly increasing cities it was the original cause of their origin.

In the consideration it is further to be deduced, that the founding of new cities in general was not at all according to the custom and uses of the vicinity. Men rather derived regularly the rules relating to the rights and duties of the citizens, the "city rights"or the "city freedom", from an older and frequently far distant settlement.

A foreign contractor, the "locator", undertook for investment with the chief magistracy or other reward, to furnish the newly created city with industrious settlers, often brought from a great distance. All this gives important internal reasons in opposition to the apparent and widely extended assumption, that the city house in its form was directly dependent on the farm houses in its vicinity. This assumption would mean that in the northern provinces, where the Saxon peasant's house prevails, the citizen's house must resemble it in plan, and on the contrary in southern Germany must be similar to the Frankish type of farm house. From our survey of the so-called "proper" citizens' houses it now follows, that in any case for them cannot be assumed such close relations to the different kinds of farm houses. Not from the peasants' houses varying in different regions, but from the simple form of the hall-like house of a single room are to be derived the house types uniformly occurring in both regions for well to do citizens. The last hope for finding at the first glance such an illuminating principle, at least in part, may be afforded yet by the study of the houses of the agricultural citizens; for it is clear, that it was most natural for these to adhere to the arrangement of rooms in the farm house as a result of like purpose.

But aside from an exception just mentioned and not capable of proof, we there find only deceptions. The examination of the existing buildings teaches us, that in general the houses of agricultural citizens in the later middle ages follow the type of other citizens' houses. It is self evident that some additions are made to their parts. A more or less spacious court is required, on which lie stables and sheds for farming implements, and this court must be accessible by means of a high driveway or a side gateway. But this affects the plan of the house proper very little, actually only so far as that a driveway readily adjoined a great hall in the ground story, but a plan generally common in citizens' houses not used for agricultural purposes, and that also was the ground form for the courts of nobles; stables and other household rooms regularly found places on the court, as shown by Fig. 157. For the produce of agriculture and especially grain, the upper story and attic of the usual citizen's house could be utilized just as well as for the merchant's goods, and we still find in the small cities of middle Germany many citizens' houses of the 15 th and 16 th centuries, in which the upper story is used as a granary as in the ancient times. If this did not suffice, or if with advancing civilization men desired to arrange these upper stories as dwellings, then were also built on the courts special granaries.

167. Houses of Agricultural Citizens at Buderstadt.

A good example, how occasionally an entire city plan was influenced by this arrangement, is afforded by ancient Duderstadt, already mentioned in the year 929. There the nucleus of the little city is formed by a long and broad open space, along w whose sides extend the citizens' houses in well preserved rows, betraying in nothing, not even in great driveways, their connection with agricultural pursuits. But behind the houses deep courts extend to the next street, that yet bears the characteristic name of "Hinterstrasse". On this rear street then rise partly in continuous rows the sheds and barns of the ancient agricultural citizens, and with their great gateways and the usually windowless walls next the street, they produce a very peculiar appearance.(Fig. 202 [159]).

Note 159. From my own photoghaph.

168. Houses of Agricultural Citizens at Rottweil.

In this and similar ways is the practice of agriculture brought into connection with citizens' and patricians' houses as a rule. But besides we find isolated in some cities of Wurtemberg notable exceptions, how at the end of the middle ages and indeed caused by the increasing scarcity of space, peculiar forms of the house of the agricultural citizen developed. Fig. 203 [159] represents a house at Rottweil and may make this evident. Similar ones are found in Reutlingen and Esslingen, for example. The entire ground story here serves for agricultural purposes. It is divided into three aisles by rows of posts, like the Saxon farm house, but certainly without thought of any connection therewith. The middle room serves as a great h hall for the house and a driveway; on the right and left of it are placed cattle and implements. A winding stairway at the rear of the house leads to the upper stories, that are arranged as usual next a rear hall and contain living rooms. We likewise find here a complete separation of the space used for agricultural purposes from the proper living rooms, thus being a plan entirely different from the well known types of farm h houses. This separation of the two groups of rooms appears as a generally valid principle, conforming to the higher culture in the cities as a special and indeoendent fact, separating the house of the citizen from thet of the peasant, as remaining to us today.

169. Houses of Agricultural Citizens in Westphalia and on the Weser.

Contrary to this opinion it seems indeed to be expressed, that in Westphalia and on the lower Weser, commencing somewhat above Höxter and near Beverungen, also extending thence occasionally eastward, numerous houses of agricultural citizens are found, that are certainly nearly a variety of the farm houses there. As the sketch in Fig. 204 [159] shows, these are houses with a hall extending through the entire depth of the house, on the right and left being the rooms with the kitchen, and a also frequently with stable rooms. The latter are wanting in the smaller houses. Above these side rooms is found an intermediate story, while the hall extends to the attic floor.

Farm houses of entirely similar design, but in which the stables usually lie in front instead of in the rear, are commonly found in the villages of the same region.

However strongly these city houses, especially in the small cities, with the unfailing addition of open areas along the streets for manure and farm implements, resemble Saxon farm houses in their external appearance with gateway and great gable, just as little must one regard them as evidence, that the citizen's house was derived from the Saxon farm house. For t the ground plan does not at all correspond to the actual type of the Saxon house, but only to a later derivative, in which is lacking the transverse hall with the hearth opposite the entrance doorway. And the examples remaining almost entirely date from the 17 th and 18 th centuries, as determined by inscriptions, yet exhibit the form world of the Renaissance almost unchanged. Few still belong to the 16 th century, and these likewise exhibit Renaissance forms.

170. Houses at Rinteln and Stadthagen.

Where such an internal arrangement occurs in connection with the earlier form world of Gothic, this is to be referred to a later construction, as on the beautiful House at 290 Brinnerstrasse in Rinteln, where the original gateway cuts through the inserted wall of a room, or in the very charactesistic houses on Niederstrasse in Stadthagen, of which a view and the plan of one are here given.(Figs. 205, 206 [160]). In their heavy e external appearance are they very expressive buildings, certainly erected by very comfortable owners, and aside from Renaissance parts, are indeed to be attributed to the 14 th century. Their external expression is such, as if they corresponded to the before mentioned houses of agricultural citizens. While the one on the left has been much rebuilt in modern times, that on the right also possesses a ground plan similar to those buildings, but still a good part of the great ground story is left free from partitions, after the style of the great halls in the citizens' houses previously considered. This was still more the case earlier, for the kitchen was first removed by the present owner from the location of the ancient hearth to its existing place; likewise the stairway found at the rear of

the hall is a later addition, that leads to the upper story of a rear addition erected in the year 1624 according to the documents. And the remaining partitions in the intermediate story and the small stairway leading thereto were only added in the year 1625, according to an inscription found on a beam of the room at the right. If we conceive these later additions to be removed, we then have the representation of a house with great hall, in which a little room lies at the left of the entrance, against its rear wall being built the hearth; thereby we have again the form of citizen's house prevailing in entire northern germany, established as the earlier form of these houses.

Note 160. From my own drawing.

To this is then added the observation, that not rarely these houses of agricultural citizens have side rooms on but one side of the hall,[161] in order to strengthen the conviction, that likewise in these regions the ground form of the citizen's house did not produce the three-aisled houses similar to the later farm houses, but a much simpler plan, namely the house with great hall predominating throughout all northern Germany. The more comfortable type with the side rooms extending the e entire depth of the hall may have been developed therefrom in both the city and the country. It is more probable, that the more highly developed cities preceded with such a refinement, and thus may one well assume, that in the similarity of the Westphalian agricultural citizen's house to the house of the small farmer in the vicinity is to be recognized far more as a very late influence of the city upon the country, than as a primitive influence in the reversed sense.

Note 161. Of this kind, for example, are the houses from Blomberg and Hameln, published by me some years since in Schäfer's Die Holzarchitektur Deutschlands. Berlin. 1889.

171. Historical Survey.

In the preceding we have come to the conclusion by reason of examination of the monuments, that for the mediaeval development of the citizen's house, the types of farm houses now known to us did not serve as models. And it is not too difficult to give also the historical reason therefor.

It is then first to be stated, that we have but few starting

points for determining the ages of these types of farm houses. From this by a more intimate knowledge of the conditions of the time, men have come to regard them as a primitive embodiment at least of the epoch of the migration of nations.(See Art. 9). The oldest examples known to us date from the 16 th century, and it alone appears determined, that the ground types of the Saxon and Frankish house was already developed, w when about the middle of the 12 th century was completed the settlement of the regions east of the Elbe. But that the ground plan of the Saxon house now common was not then fixed there is indicated by many signs. Thus the oldest remains known to us of such a house in Gross-Siepen,[162] that perhaps still belongs to the 14 th century, by its five-aisled plan very distinctly differs from the usual three-aisled form. But the development of city life, the building on the free ground within the oldest cities already introduced it about two centuries e earlier. If the consideration of the remaining German monuments,-- aside from easily recognized influences by foreign forms -- indicates the simple plans with a single room as the archaic type of the German citizen's house, then near this lies the idea, that in that earliest time of development the German farm house still adhered to this simplest and oldest type. By force of the previously mentioned custom of adopting arrangements and experiments from the oldest cities, and since the space in the cities quite early became limited and costly, the ground form with a single room further remained more clearly expressed in the citizen's than in the farmer's house, and the further development of existence made necessary by an improved mode of life, took different paths in the cities and in the c country. To separately follow these diverse courses here cannot become our task, on account of the lack of space. For the study of the farm house, whose representations entirely belong to the period after the middle ages, we must refer to the exhaustive publications of the German, Austrian and Swiss architectural and engineering societies, and limit ourselves to a few remarks on the two chief groups. In southern and western Germany, men in the country combined into one structure the main house containing the hearth, the sleeping rooms and the

stable, when the two latter were added beside the former, thus cheating the well known type of the Frankish farmer's house. In the cities was secured the space desired for a more comfortable life by the arrangement of an upper story, whose development from the undivided "summer house" into the chief story f for living rooms and furnished with a hearth, we can follow in the preceding examples, as well as its increase to the number of two or three stories.

Note 162. See Denkmalpflege. 1905. p. 49.

In the north accustomed to a ruder mode of living, men longer adhered to the old scheme of the spacious hall. In the country, men combined with the latter the stalls for the cattle without separating these by walls. Thereby resulted the ground type of the Saxon farm house, that consisted of the longitudinal hall with stalls along both sides and the transverse hall with the house hearth, and in this form -- without the later chambers developed as more important living rooms --the citizen could not be actually induced to imitate it. In the cities was no opportunity for a triple division of the hall on account of the few cattle kept. It was at first left substantially undivided, and only separate and strictly isolated rooms were built within it. One or more upper stories were indeed added, mostly not for living purposes but for storing in t them the products of farming or other commercial goods. How the separation of distinct rooms also increased here, until b but slight fragments of the old wall remained, or indeed entirely disappeared, we have likewise shown by characteristic examples.

But besides the use of such space economizing inserted rooms, men preferred for important houses the effect of the great hall, corresponding to the hall in English country seats, far b beyond the time treated in our description, accepting therewith the disadvantages and inconveniences of such a side room. The well preserved wholesale houses of old Lübeck with their great halls descending into the Rococo period on the one hand, and on the other hand the changed and essentially richer form of the so-called Leibnitz House in Hanover,as an example from the middel of the 17 th century, show with what power the basal

idea of ancient German house architecture maintained itself in north Germany, even under entirely changed conditions of living.

c. Public Buildings.

1. City Halls.

172. Earliest Occurrence of City Halls.

The need for erecting public and non-ecclesiastical buildings developed but gradually in the middle ages; complex arrangements for administration, for which shelter must be created, no longer existed after the down fall of the ancient order. Under the influence of the national custom of victorious Germans, there prevailed everywhere the habit of holding popular assemblies, sittings of courts etca, under the open sky. Likewise in this respect first come impulses from the rising cities and from their civic self-administration. It soon became necessary to care, both for the commerce as well as for the common business, for the rights belonging to the citizens; this is the government of the area of the city or the public weal, maintenance of streets and regulation of the markets, keeping up roads and fortifications etc.[163] Of arrangements for facilitating the market traffic, the earliest appears to have been the erection of open hall structures on the market place. They w were mentioned in certain German cities already in the 12 th century, and were perhaps known still earlier in Italy and France. At the same time as such market halls was also mentioned in other cities the existence of a house of the citizens or a city hall, first in the year 1120 in Soest, thus a building, that could serve for assemblies of the citizens or their representatives. Thus appear at the beginning these two purposes, commerce and administration, each preserved by itself, for which in the different countries one and sometimes the other required the precedence in architectural provision. Particularly were the assemblies of the citizens commonly held on the court of the ruler of the city or in the rooms od a monastery. But already soon was developed a form intended in common for both requirements, and a basis was permanently produced for t the further treatment of buildings for city halls. Men combined the rooms of the merchant and of the citizens' hall or the city hall serving for both uses, into one building containing

a hall, in which regularly the market traffic occupied permanently the lower story, the upper story receiving the assembly of the citizens. Furthermore this upper hall could also be utilized for so many other **common uses, as a festal hall for** the citizens etc.

Note 163. A rather thorough, but still comprehensive survey of the development of the mediaeval city government and a richer collection of old examples have been given in Stiehl's Das deutsche Rathaus des Mittelalters (Leipzig, 1905), to which r reference may here be made.

173. City Hall at Gelnhausen.

In the most primitive manner is this simple form embodied in the oldest city hall remaining in Germany, that at Gelnhausen. (Figs. 207, 208 [164]). It lies on sloping ground and to equalize this is furnished with a high substructure, that as a terrace projected 13.1 ft. from the lower story of the hall, and which was well suited as a place for addresses by the council or for the public city court. Otherwise the building only contained the two halls mentioned, the upper one of these being accessible by a flight of steps added at the end, but was at first reached by an internal winding stairway in the 15 th century. Both halls had fireplaces at the rear wall; their openings for light were still in nowise arranged for closure by glass or wooden shutters. One may regard the hall as an intermediate step in the course of progress, that leads from the southern custom of an open hall structure to the design of enclosed and glazed halls. These later became common in the north for obvious reasons; but frequently the lower room for merchants opened at one side into a portico. In this then usually occurred the sittings of the courts, in which the anci-
164 ent custom of meeting under the open sky was retained longer than for other public assemblies, and this occurred rather, if the citizens succeeded in obtaining the jurisdiction not belonging to them at first, by money or other services in their power. On the contrary in Italy the most complete change of the lower story into a portico with supporting piers or columns w was a great favorite. And just this simplest form of the city hall, consisting of a lower portico open externally and an up-

upper enclosed hall there remained as the type of city hall in even important cities. Our representation of the city Hall at Piacenza may afford a view of the richness and of the heavy expression, to which it was raised.(Fig. 209 [165]). Contrasted with this is the illustration of the graceful City Hall in Ledbury (Fig. 210 [166]) as evidence that this open form of hall was retained as a reminiscence of the open halls on the market place.

Note 164. From Stiehl etc.

Note 165. From my own photograph.

Note 166. From the Architectural Review. 1889. p. 120. Half Timber Houses in Worcestershire.

174. City Halls in Dependent Cities; Tangermünde.

But not everywhere by far were the citizens left to self government, as in the cities directly subject to the empire as well as to the varying and distant power of the emperor. Rather occurred the endeavor of the lesser princes and masters t to retain in their own hands the rule of the community, that was located on their own land and soil, owing them rent and service, and to govern it by mayor, aldermen or judges. This occurred as a rule with the assistance of a committee of citizens, appointed or at least confirmed by the lord of the city, and that were mostly termed magistrates. Where this happened to the city government, the merchants' house and the hall of the citizens is not the basis of the city hall, but it takes the form of a small official building, that only needed to contain a few rooms of moderate extent for the sittings of the m magistrates and the transaction of the necessary business in writing. Likewise with it was more frequently connected the plan of an open portico, beneath which the court could be held in public on the market place. A very charactesistic example of such a building is the charming City Hall at Tangermünde. It consists of several parts of different ages.(Figs. 212, 213[168]). The oldest portion is the gabled structure characterized by t the most luxuriant tracery (Fig. 211 [167]), in which are found two halls over eahc other and supported by a middle pier. The somewhat later and more lightly shaded wing in our illustration contains in the ground story the portico for the judges, o

over this being a rectangular room available for sittings or for writing. It also exhibits in simple forms a very characteristic example of the strong north German brick architecture.

Note 167. From Gurlitt, C. Historisches Städtebilder. Stendal - Tangermünde. Berlin. No date.

Note 168. From Stiehl. etc.

175. City Hall at Ochsenfurt.

Although such a building with most of its rooms, that only served for administrative purposes, already testifies to a tolerably advanced condition of city life, yet it did not suffice for such cities, that had attained to more abundant activity in commerce and manufacturing. For with the blossoming of these two branches of civic pursuits, there arose for the city government an abundance of new problems.

The substitution of financial traffic for the old agriculture, the supervision of manufactures and of the more greatly developed commerce, the collection of gradually introduced taxes and dues of very varied kinds, and also not the least, the more artificially developed warfare required a division of the labor of administration, and occasioned an increased need of space.

For such demands was calculated the City Hall of the little city of Ochsenfurt-o-M (Figs. 214 to 216 [169]), that was erected about 1490 to 1505. Above a lower story, which may have served as an armory and stable, rises the second story upward in Fig. 215, in the main structure consisting of a great hall as an anteroom and a council hall. In a side building added later are arranged two writing rooms, from one of which a small winding stairway leads down to the lower story, and affords the possibility of bringing unseen any prisoners before the c council. In the third story (Fig. 216), that occupies only t the main building, no less than 5 separate rooms adjoin a smaller hall. The exterior (Fig. 214 [170]) affords a charming example of how with with complete adaptation of the architecture to the irregular subdivision of the interior a gracefully animated expression may be produced without disquiet. A high flight of steps with ornamental tracery balustrades, the arms of

the city and a beautiful statue of the Madonna on the angle at the right hand animate the plain surfaces of the two stone lower stories; above them projects boldly the upper story constructed of hal timber work with its imposing clock tower, producing striking shadows.

Note 169. From my own drawing.

Note 170. From a drawing by H.A.O.Müller in Deutsche Bauhutte. 1905.

176. City Hall at Münster-i-W.

For a further development of the civic conditions the hall building of the free citizens also could not remain in the simple form first mentioned; subordinate rooms must be added thereto. For to carry on the administration of the property of the city, to protect the rights of the citizens outside it,and to care for the increasing problems in the interior of the city, the general assembly of the citizens, for which the great hall was created, was not permanently adapted. Men rather chose from themselves a number of prominent citizens, in order that they as the council of the city might carry on the current administration under a burgomaster selected by themselves, while the general assembly of all the citizens, the entire populace, was held only for the most important decisions. Besides the council exercising its powers without remuneration, there further appeared the secretary of the council as a salaried official.

It thus became necessary to provide corresponding rooms for these new members of the administration, and these were usually added at the end of the great hall without changing the rectangular ground form of the structure; mostly in the second, but also occasionally in the ground story.

On the beautiful City Hall at Münster in Westphalia such a still simple ground plan (Fig. 218 [171]) is combined with a very rich development of the front gable facade.

Note 171. From Stiehl etc. p. 49.

For the ground plan is it to be noted, that the very large council room here appears as an addition to the older two story design with halls. Already at its erection in the 15 th century it was equipped with a monumental bench for the coun-

council with a richly paneled wall with canopies behind this, and in the Renaissance period by restoration and the addition of further ornamentation was made a remarkable example of its kind. Adjoining it is a separate addition was formerly the o office of the secretary of the council, now destroyed. Before the rebuilding, that occurred at the middle of the last century, the hall building formed a two story hall with plane ceiling, which was by far the usual form of such rooms. In the ground story is an open portico on the facade, that was still used for a court in the 17 th century. Besides the two great entrances to the market hall, a small doorway on the central axis leads down to the cellar, likewise used for mercantile purposes. Above the four plain arches of its exterior, the facade of the citizens' hall is adorned by splended windows, statues and canopies, likewise arranged on four axes. Over this rises the tall gable in seven divisions, a proud manifestation of civic power in the rich animation of the roof edge by tracery windows ind figure decoration. With this the practical and material points of view were not neglected; for the plain openings on the middle axis of the gable served as openings for hoisting, and also the vast attic for storage of rental grain, a chief portion of the income from landed estates, or was used as a warehouse for other goods.

Note 172. From Verdier & Cattois. Architecture civile et domestique au moyenAage et a la Renaissance. Vol. 1. p. 156 et seq. Paris. 1855.

177. Compound Plans.

Besides the plain rectangular for of these buildings, that is very common in simpler or richer development, there elsewhere occurred the related arrangement, that the rooms of the council were in a structure added at the longer side of the hall. Thus the City Hall in Dortmund, whose main building dates from the 13 th century, was completed about the year 1400; other fine plans of this kind are found in Jüterbog and Stendal, in Brandenberg, Pirna, Sulzbach etc. We shall find them in a transition state in describing the city halls at Duderstadt and nuremberg, and therefore omit the representation of a particular example.

Still more complex forms are developed, if besides this addition of new rooms, the requirements for the extension of the halls so increased, that their number was enlarged, on account of the extending commerce. Then men preferred to join two hall structures of the usual two story kind at a right angle in an L-shaped plan, when sometimes the open and sometimes the closed side of the angle was turned toward the open market place. The first arrangement is shown by the City Hall in Brunswick, for example, in a design greatly enriched by the addition of the stately two stried portico. For the closed form may be mentioned as an example the picturesque structure of the City Hall at Saalfeld.

178. City Hall at Lübeck.

Another peculiar form was again developed by the Baltic cities for the combination of the two hall buildings. Standard for this is the nucleus of the Lübeck City Hall.(Fig. 219 [173]). There were erected already in the 13 th century two parallel two story rectangular structures, so that a free space about 32.8 ft. wide was left between them. The upper building in our illustration served as a "cloth hall" for the trade in fabrics, the other indeed in the usual manner as a market below and above as a citizens' and a"dance hall". Both buildings, as well as the court lying between them had cellars beneath for the traffic in and the retailing of wine on the greatest scale, carried on by the council. At the beginning of the 14 th century was the whole rebuilt, enclosing the space between the two buildings by a massive wall with horizontal upper termination extending up to the ridges of the roofs of the halls. About 50 years later the entire plan was extended toward the rear about 45.9 ft. Thus was obtained an enclosed and very imposing architectural form by the high walls enclosing the court, to whose influence is due the city halls of so many Baltic cities, such as Stralsund, Rostock etc.

Note 173. From Stiehl.

Like most city halls of such cities, that attained to historical importance, that of Lübeck has also suffered an entire series of alterations and additions.

Such additions of about the year 1400 are the transverse

wall in the ground story of the market, by which this was divided into the smaller room for the market judge and the larger council room, and the open columnar portico of the longer side, from whose upper landing were proclaimed the decisions of the council and of the assembly of the citizens; it may have also been utilized below as a judgment portico. Likewise the rooms lying at the end of the court and between the t two main buildings were only added later. Important enlargements were suffered by the building, when Lübeck rose to be the chief place of the Hansa, and the assembly of the representatives of the cities occurred in its ancient citizens' hall. This hall building was already extended about the year 1400 by a wing, vaulted on piers below as an open hall, but received above another great hall (only partially represented at the left in our illustration), and this wing was enlarged in 1442 - 1444 by an addition of equal size. All these parts of the building show on its exterior the dark color and the strong form treatment of north German brick construction, animated by particolored heraldic arms, light plastered panels, as well as metal ornaments of different kinds. Thus the mediaeval building with its intentional accenting of the masses of the structure strikingly expresses the powerful and probably ambitious feeling of the old citizens. First in the Renaissance period by the addition of ornamental cut stone work has been added another and more delicate color in the general effect.

179. City Hall at Duderstadt.

In Lübeck the problem was solved by an enlargement of the great hall, indeed under the influence of the plan of the hall in important houses also common there. But elsewhere men endeavored to follow the extension of administration by the gradual addition of small rooms. On the City Hall at Duderstadt this led to a very picturesque effect. There was a hall building with foundation walls dating back in the late Romanesque period. Its enclosing walls are indicated by black coloring in Fig. 220 [173]. In the year 1432 this hall was rebuilt in Gothic forms, and at the same time an addition was m made at one of its ends, at the top on the left of our illus-

illustration. In this was first placed the council room with a small anteroom, as uell as a writing room, and further the archives in an intermediate story below. The projecting angle between these two rooms was probably already utilized for the plan of a portico for a judge, but its angle pier was later restored, and the deeply sunk cellar story was used for
191 the important public wine cellar. Thus originated the form of an L-shaped ground plan mentioned in Art. 177, and the whole was still plainly built, even though entirely of ashlar masonry. Only after another century and in the years 1528 - 1533, substantially for artistic reasons, another addition was made to the still free side (Fig. 220, below). This opens in each story by three wide archways as an open portico, and besides contains in each story only a small room, that found in the ground story being explained as the chapel of the council. But over the entire ground area of the building was constructed a half timber structure, partly one and partly two story, treated in the most animated manner by roof bay windows, gables and turrets, that besides its artistic effect had no other purpose, than to create an attic for storage of rental grain.(Fig. 221 [174]). With this ends the mediaeval history of our City Hall; the walls shown in outline in our ground plan indicate additions of the 18 th century.

Note 173. From Stiehl.

Note 174. From Lehmgrübner, P. Mittelalterliche Rathausbauten in Deutschland. I. Fachwerksbauten. p. 77a Pls. 4,5. Berlin. 1905.

180. City Hall in Nuremberg.

The ending of this gradual improvement of the city halls is naturally found in the city halls of the great mediaeval cities, and it will be worth while to likewise present one such at the close of our examination. As one of the most prominent examples, we have selected that of Nuremberg.[175] It differs from the examples previously described, in that it was almost wholly intended for the use of the city administration, and that it served mercantile purposes to but a slight extent. This is explained by an earlier city hall, which in the usual manner fulfilled the requirements of commerce and of the bus-

the business of the council, was entirely abandonedtto traffic about the year 1330, and therefore the new building could be arranged chiefly for the use of the council.

Note 175. For the description of the building, besides that given by von Essenwein in the first edition of this Heft, there has been used the publication of E. Mummenhof: Das Rathaus zu Nuremberg.(Nuremberg. 1891).

Local historical investigators have suggested all sorts of conjectures concerning the sudden leaving of the old city hall, before the new building was even commenced. The reason first mentioned by von Essenwein appears to us to have given occasion, that the development of the manufacture in traffic in cloth after the example of the Netherlands required it, and that accordingly a greater space must be freed for the c cloth trade. Thus the abandonment of the building falls just at the time, when the most vigorous trade relations with the Netherlands occurred, and the privileges in the Netherlands secured by the Nurembergers were ensured by contracts.

The old city hall and cloth house was only torn down in 1569, and a description written on the occasion represents it as a structure 118 ft. long and but 24 ft. wide, that formed a single hall in the lower story and was divided into two rooms in the upper story. According to the requirements taken into c consideration in all city halls of that time, we must assume that one of those rooms in the upper story was the hall of t the citizens, the other being probably further subdivided by partitions and containing the additional rooms required for the council, the ground story serving for the cloth traffic. There is nowhere mention of a tower. A cloth hall of the dimensions just given corresponded to the conditions of a small city, but could not satisfy the constantly increasing needs of the city of Nuremberg, so that a change must be made, and since evidently the cloth trade, if not to be taken away from Nuremberg, if it were to assume there even greater importance, could not do with the space assigned to it, since larger stocks of foreign and dutiable cloths must be imported, especially from the Netherlands, so that the council decided to immediately abandon the entire building to the cloth traffic, on-

only a portion of which it had used, to put up with a makesh-
ift for a short time, and to build a new city hall.

This was then arranged in dimensions corresponding to the
growing city. As everywhere, the principal part was the gre-
at hall building, which for a length of 141.1 ft. externally
had a width of 34.3 ft.(Or 128.0 × 27.7 ft. inside). This is
195 indeed the only portion remaining from the rebuilding period;
reason sufficient for many to decide, that it was the only p
portion built at that time. But since it is not contested,
that even then other rooms were also necessary, as for other
city halls of equally developed cities, then remains only the
assumption, that they were erected at the same time with it,
or were provided in older buildings in the vicinity. This i
is the more probable, since already soon after 1340 works of
maintenance in an adjacent house were mentioned. Also draw-
ings made before the erection of the great Renaissance new b
building show on the west side of the city hall a similar st-
ructure with a passage beneath it, such as still exists at
the east. The building site obtained in 1332 also comprised
the smaller court, in which was the flight of steps to the
hall, without which one could neither reach the hall nor the
two rooms at the eastern and western sides. A landowner's
house must also have been purchased in the 14 th century and
196 indeed soon after 1340; for then the building of other rooms
first became possible, that are already mentioned early. Our
ground plans (Figs. 222, 223) show this oldest portion in bl-
ack; the division walls in the north still exist, while the
second part to the line N M O is that landowner's house, in-
stead of which buildings were erected in the 14 th century.
The Nuremberg City Hall never possessed a tower, like most
in Germany. The other buildings adjoining the hall on the e
east had become so inadequate at the close of the century,
that they were entirely rebuilt by Hans Behaim in 1500 - 1515,
both internally and externally and were also enlarged. From
the transactions relating to the rebuilding of the different
rooms, we learn that similar rooms previously existed.

This rebuilding relates to the erection of new stories on
the two houses adjoining the council room, that had already
been purchased, and their entirely new internal construction,

and further to an extension of the council room by a project-ion toward the alley. Although the whole was only a patchwo-rk according to the originator's own statement, then origina-ted the splendid new facade of the council room (Fig. 226), together with the charming bay corbelled out in the court and a multitude of spirited details on the stairway and the vaul-ts of the interior.

The hall building of the 14 th century was not changed in its nucleus, although much ornamentation occurred; only the rebuilding of the 17 th century cut off the western portion. The hall represents a further advance in the development of hall construction for Germany, since the previously common t two story arrangement was dropped, and the ground story beca-me a mere substructure.

The latter is quite low and is divided into two rows of ce-lls, that served for trade purposes, indeed at first for the cloth traffic. But under these cells in the cellar are also found cells, the famous prison dungeons. The hall itself (s (see section in Fig. 225 and the gable facade in Fig. 224 [176]) has plain enclosing walls without architectural subdivision; the eastern side has a little apse between two tracery windo-ws with pointed arches and a great round-arched window above it. The eastern and longer side shows 10 such windows at eq-ual distances, while two are cut off with the western side, that once had 3 windows and a rosette over them. On the nor-thern side are found 3 entrances, the middle one with a stair-way built by Behaim and leading from below, indeed an imitat-ion of the stairway of the 14 th century, that led directly from the court of the city hall, the continuation of the mar-ket place directly to the hall; the other two connected the rooms on the east and west sides of the court with the hall. The framework of the roof yet remains and exhibits the ordin-ary construction then usual for wooden tunnel waults; but it formerly had tiebeams extending free in the hall, on account of the great span. These were first replaced in the 17 th century by the still existing iron tierods.

Note 176. From von Essenwein's attempt at a restoration of the original condition.

G in Fig. 223 is the great hall; K was the council room, w which at the beginning of the 16 th century was enlarged by the area Q; L is the room for administration of taxes; beneath K and L were open passages, so that the court H extended to the alleys at each end, thus being entirely open and accessible. In it the stairway Q leads upward as the only ascent to the hall, while the stairway J extends down to the subterranean prisons, whose still well preserved plan and arrangement are very notable, even if philanthropists do not find them worthy of imitation.

In Fig. 222 A is the torture chamber; B are separate punishment cells; C are ordinary cells for safekeeping; D are rooms for the kitchen, the smith's shop, a bath etc.; E are entrances to F, a subdivision or network of passages. None of the cells has even the least direct light; only through the openings in the doors could a little light enter the cells from the passage lighted by light shafts. The part on the left of the observer in Figs. 222 and 223 is shown in its later arrangement, in which the heavier shaded portions are those of Behaim's buildings of 1502 - 1515, these lightly hatched being those of the 17 th century.

2. Other Public Buildings.

181. Merchants' Halls.

In all cities indeed was the city hall the most important public building, and for small communities was it sufficient for all community purposes, even in its simplest form. But in the larger and richer cities occurred also a number of public buildings besides the city hall, that partly served for trade purposes, partly for schools and the care of the sick.

For the cities that appear as centres of the wholesale traffic, their needs for space so increased, that to confine them to the single existing merchants' hall was impossible. In m many cases the city hall was so enlarged, that a number of h halls was obtained. Thus for the L-shaped plans mentioned i in Art. 177 and for the buildings following the Lübeck scheme. But the two purposes were often entirely separated. For either the old city hall was retained as purely a building for administrative purposes, and a new merchants' hall was erected

in another place, as for example in Gelnhausen, or the old b building was left entirely to commerce, as in Nuremberg, and a new city hall was built on a different site. The former seems to have been the more usual case, The merchants' hall then generally became a detached two story structure, that e entirely corresponded in form to the oldest and simplest city halls, and naturally it was used for large public functions like them.

Such merchants' halls frequently required very considerable dimensions, when men, in accordance with their increasing need of space, gradually and rapidly added one extension after another. Besides the very famous Silk Hall in Valencia,[177], the halls in the Netherlands had the fame of being the largest. They served particularly for the cloth traffic, that of all branches of industrial activity first assumed such extent, that the city hall no longer sufficied for it. The Cloth Hall of Ypres, with which is combined the massive city Belfry, attained the length of 436 ft. in round numbers; it must have been commenced already in the year 1200 by Baldwin of Flanders; its last enlargement indeed followed only in the year 1304. The Hall at Bruges forms a rectangle of 275.6 × 142.7 ft.; it was begun in 1284 but was not yet finished in 1304; its tower had a total height of more than 351 ft.

Note 177. See Verdier & Cattois. Pl. 173.

Likewise in middle Germany at the close of the 13 th century and in the first half of the 14 th appeared these halls f for commerce, particularly for the cloth traffic, which then affected the world. Among the buildings of this kind, the Merchants' Hall at Mentz first occupies out attention.[178]. Even if not equal to that in Ypres in dimensions, it was still a large strumture, whose plan was a trapezoid 137.8 ft. 1 long, whose wider end measured 68.9 ft. The building was completed in 1313. Unfortunately at the time when Mentz was French, it was torn down; yet Moller made careful drawings of it, and he published these later in his well known work. Figs. 227 and 228 reproduce the plan of the upper story and the elevation of the eastern or wider end.

Note 178. See Moller. Denkmäler der deutschen Baukunst. 4 4 th edit. by F.M.Hessemer. Vol. 1. Frankfort. 1854.

Both stories were arranged alike and were each vaulted in three aisles; the cross vaults with narrow and sharply profiled ribs rested on low square piers without capitals, pierced by the very regularly arranged ribs. In the ground story on the end here shown to us, which is indeed the proper facade, was arranged a rich projecting portal, opposite which on the western side was a great doorway, while in the middle of both larger sides were small doorways. An external stairway on the north side led to the upper story, from which the hall was entered at a. At b was a great opening extending to the floor, that might serve for hoisting large and bulky goods, as well as for the addition of a temporary festal entrance a, whether as a stairway or as a ramp for riding up into the hall.. At c was a small room, that in its form as separated from the hall can hardly be regarded as a chapel, as it is frequently explained. We might rather see in it a room for the "market masters", i.e., the councillors placed over the market or their assistants, perhaps also a room for money changing. The base of the roof was decorated by an ornamental battlement cornice with angle turrets. When Moller made his drawings in the year 1805, the building bore a low and plain roof. In the view of Mentz by Merian the building may be recognized beside the city hall, and one may see that it had a number of parallel gable roofs, at least five, corresponding to the five divisions of the vaults. The external treatment of the entire building was very simple; only the middle part of the east side and the two windows of its upper story exhibit a striking richness for a German secular building of that period. The battlements of the eastern side even bear figure decorations, with S. Martin, the protecting patron of the city of Mentz at the middle and on horseback. In the panels, that were already empty in Moller's time, indeed stood the other patrons, S. Stephen and S. Albon, and then in 8 other panels were the figures of the emperor and the seven electural princes, for which it is notable, that even the three ecclesiastics were not in priestly costume, but were represented in knightly armor; those of Treves and of Cologne had mitres beside them, which was wanting beside that of Mentz.

183. Merchants' Hall Gürzenich at Cologne.

Likewise in Cologne the hall structure of the City Hall in its limited dimensions of 65.6 × 27.9 ft. could no longer suffice for the greatly extended commerce. Therefore men decided already at the beginning of the 15 th century and directly after the completion of the tower of the City Hall, to erect on the not distant Quatermarket of the Gürzenich, which was begun in 1442. It received in each of the ground and the upper story a hall about 196.9 × 75.5 ft. (Fig. 229) with the notable story height of about 23.0 ft. To the hall an external straight flight of steps led on the north side; side buildings did not exist. On the contrary for special occasions the house lying on the west side of the Quatermarket and separated by a court, which was then connected with the hall by a wooden bridge, was utilized as a subordinate room. Thus in particular the emperor Frederick III and Maximilian, at festivals given by the city to them, through the opposite house and by a wooden bridge, entered the hall by means of o one of the great windows.

Note 179. See Köln und seine Bauten. Cologne. 1888. p. 107 et seq. By Arch. und Ingen. Verein für Niederrhein und Westfalen.

The hall was in two storees, like most of its kind. Nine wooden posts supported the main girder extending lengthwise as well as 9 transverse beams, that divided the hall into 10 bays. The walls were entirely plain; the north side was without windows and only contained the entrance doorway; the other three sides were furnished with great windows with stone crosses in deep recesses. On the eastern and western sides were pilasters corresponding to the row of wooden posts, which are still preserved, as well as the two state rooms on the southern side, on account of which at both sides the original windows were arranged to have but half the width of the others. The otherwise entirely plain hall was richly equipped with h hangings and other art works on festal occasions, and it has come down to us in such manner, although it has become somewhat ruinous. It was not high and stately enough for our time, and the mighty impression of its interior did not suffice to

save it from restoration, that was commenced in 1868. Most fortunately Wiethase has adopted the ancient condition.

The external treatment of the longer sides was very plain, merely a simplification of the systems of the two ends, since they are scarcely seen, while the southern side is on a narrow street, and the northern side is next the court, now built over. On the contrary the eastern and western sides were treated in a peculiar way; they reproduced all the peculiarities of the civic architecture of the 15 th century in Cologne and therefore became the prototype of many other buildings. (Fig. 230). The ground story is plain with great doorways at each side, between them being 4 windows divided by stone mullions, that are new. Figures beneath lead canopies stand over each doorway. In the upper story with an independent axial arrangement are 6 great windows with stone crosses between narrow piers, which continue the architecture of the stone crosses by relief bands and tracery. The outer piers are wider and are further subdivided by a middle vertical band. On each pier and above these bands lies a shield with the arms of the city, such as its soldiers bore. The wall above these windows ends at top in battlements and is likewise covered by bands; at the angles little columns standing on corbels support a small bay window without spire, projecting slightly beyond the battlements. Corresponding to the two aisles of the hall are two long parallel roofs, between which extended a gutter on the building. This arrangement of the roof, which was in its height in very happy proportions to the lower architecture, substantially determined the impression of the building. It was removed during the restoration, while otherwise most of the exterior was faithfully restored.

184. Merchants' Hall at Constance.

Still more extensive and the largest of its kind in Germany is the Merchants' Hall in Constance. It again contained two halls, one above the other, 157.2 × 105.0 ft. in dimensions, and divided into 3 aisles by two rows of wooden posts. The aisles are so wide, that recently an iron railway track has been laid through the middle one, to facilitate the receiving and shipping of goods; for the lower story still serves for

its ancient purpose as a room for sales and storage. In spite of the not very imposing story height of 16.4 to 18.0 ft. for its great extent, the halls make a grand impression by t the bold construction of the beam ceilings, whose beams in the ground story have the considerable dimensions of 2.6 ft. (31.5 ins.) square. The external architecture is very plain. A picturesque impression is secured by the building, only because on the side closely adjoining the former city walls -- and on that alone -- it has been furnished with wooden corbelled porticos and angle turrets, and thus by its greater height it contributed to the defense of the city wall. On account of this participation in the fortifications, it was mentioned in the preceding Heft (1 st edition, Fig. 186, p. 243) of this Handbook.

185. Meat market at Münster-i-W.

But besides such buildings serving for the wholesale traffic of important localities for staples, there are also found other more modest designs of purely local importance, mostly intended for a single commercial product, such as shoes, grain, meat, bread etc., affording special places for its sale. These were also either built detached on the market place, or men were satisfied by inserting them in a row of citizens' houses.

For an example of such a kind is the old meat market at Münster in Westphalia represented in Fig. 231.[181] On a deep lot, it forms in the ground story a high hall fully 23.0 ft. wide in the clear. A small flight of steps naturally once led up to the entrance; the wall above is fully opened above by four windows with stone mullions and tracery heads, in order to a admit light into the hall as far as possible. In the upper story and in the roof was further obtained storerooms, by the rent of which its income could be increased.

Note 181. From Schäfer, C. Holzarchitektur Deutschlands. Berlin. 1889. (Reconstructed by von Essenwein).

186. Butchers' Guild Hall at Hildesheim.

A different form of a provision for traffic was preferred for the sale of meats, at least in the later middle ages, which easily became troublesome in closed rooms by the odor and

by insects. It consists in the arrangement of an elongated court extending from one street to the other through the building, along which the stalls of the butchers were placed on both sides as if along a narrow alley. Such meat markets recall the modern "passage" (bazaar) and are made known to us in Thorn by the documents; a late and quite artless example is still well preserved in Neustadt-on-Orla. A middle place between both forms is occupied by the House of the Butchers' Guild at Hildesheim, well known for the splendid execution of its half timber construction, that we represent in Figs. 233 to 235.[181] It contains in the ground story as the principal room a hall in two aisles and nearly 19.7 ft. high, that is accessible at the ends, and along which on one side are arranged a row of small stalls -- open both to the hall and to the street. Over them is found in an intermediate story another series of similar rooms, that may have served as offices or storerooms for smoked meats. The cellar story was covered by three tunnel vaults, from its arrangement being denied the subdivision of the ground story, which could be rented as storerooms to associates of the guild or to strangers.

Whether the upper story was originally subdivided in the manner here represented, or in particular the "drinking room", i.e. the festal and assembly hall of the guild was found there is uncertain. This hall might properly be seen in the larger rooms. But it is very possible, that also this upper story was first planned as an undivided wareroom for rental, as certainly occurred in the third and in the attic stories.

187. Storehouses.

The need of storerooms must indeed have been very great in mediaeval cities. This corresponds well to the fact, that b bulk goods, such as wine, wool, dried fish, salt and the like, must be dealt in at remarkably great distances. The Florentine woolen weavers long brought the wool for their famous cloths from England, indeed through France by the overland route. And in every city possessing the right of warehousing, the traveling merchant was compelled to offer his goods for sale for a certain time, unless he were released from this r

by a payment. Therefore besides the extensive attics for storage arranged in the houses of citizens and in public buildings, there were also erected entire buildings wholly for this purpose. A considerable number of such purely storehouses remain in the city of Nordlingen, for example, that still present to us like few others an unchanged representation of the comfortable nature of mediaeval city life.

188. School Buildings.

Substantially from the needs of commerce were also developed the schools of the cities. Arithmetic, reading and writing were needful to the merchant, without other learned additions. Schools with instruction in the German language were therefore founded everywhere by the larger cities, beside the old Latin schools of the monasteries and cathedral foundations. Not much architectural expenditure was certainly necessary for them, since the number of pupils was never very large, and a division into different classes could be omitted. In most cases they were arranged in some existing house. And even if a new school building were erected, it also contained only one or two rooms like halls, as well as some chambers as the living rooms of the teacher, thus not differing essentially from the usual dwelling.

189. Universities.

Very gradually was developed the arrangement of higher schools, of universities. They go back to the learned monastery schools, in which were taught the seven "tree arts"(grammar, rhetoric, logic -- the trivium --, as well as arithmetic, geometry, astronomy and music -- the quadrivium). To this was occasionally added Roman or canon law (Pavia, Bologna, Ravenna) or medicine (Montpelier). In important places several s such schools were in competition, as in Paris the cathedral school, famous in ancient times, was with the later flourishing schools of S. Genevieve and S. Victor. In such a competition the schools also then called prominent secular instructors, and thereby attracted hundreds or even thousands of students. The Spanish University of Alcala de Henares was attended by 14000 to 15000 students. According to the mediaeval custom, these were gathered into countrymen's societies, and

thus in the beginning of the 13 th century was formed the permanent subdivision by "nations", each also comprising the corresponding professors and having its own rector. Fifty years later and first in Paris, the professors withdrew from the n nations and united in their faculties, according to their specialties:-- theologians, lawyers and physicians. The nations, weakende by the withdrawal of the instructors, immediately combined in the "university" for harmony in their views, i.e., the unity of all attending the higher school, only comprised in the fourth faculty with a single voice in common.

Important for us are these conditions, that were also determinative in the founding of the German universities, because each faculty had its own lecture halls and its own church. Further since living alone was frequently forbidden to the s students, and they were divided by "nations" and collected i into common houses, called "bursas" or "colleges", an arrangement that has survived until our days in the colleges of the English universities. And the condition of separation w was then increased, Since the diversity in the universities increased, after the mendicant Orders of Franciscans and Domicans had also taken their general competition into the universities. Thus we find scattered in the entire city the houses of the colleges with their halls and bursas, greater or smaller in extent, and which again were special foundations for certain countrymen.

Thus the universities also afford for us a tolerably varied representation of different plans. Soon they were arranged like monasteries, like the College of Cluny in Paris, that contained a cloister with a church, large lecture hall and an anteroom, or the University at Alcala de Henares,[182] whose extensive buildings comprised a considerable number of courts like cloisters. Very much simpler, for example, was the three story rectangular building of the "Red College" at Leipzig,[183] that in the year 1511 was commenced as a "new bursa", containing chiefly living rooms for the students, besides two halls in the ground story. Examples of pure bursas or living houses for students still remained in Leipzig until recently, buildings of a very simple kind.[184] Likewise the College of S.

Michel at Caen [185] forms a plain rectangular structure with three lecture halls in each story, besides an added stairway.

Note 182. See Verdier & Cattois. Vol. 2. p. 161 et seq.

Note 183. See Leipzig und seine Bauten. p. 66, 90; -- also Gurlitt, C. Beschreibende Darstellung der älteren Kunstdenkmäler des Konigreichs Sachsen. Hefts 17, 18; Stadt Leipzig. p. 250. Dresden. 1895.

Note 184. See the same. Vol. 2. p. 160; -- also Gurlitt, p. 255.

Note 185. See Verdier & Cattois. Vol. 2. p. 163.

190. So-called University at Erfurt.

If the proper instruction and residence buildings of the universities were very variously treated, yet to all these establishments was common the need of a great hall, in which occurred festal assemblies, examinations, disputations and t the like were held. There remains to us the Thesis Hall of the University at Orleans, an elongated room, covered by eight cross vaults on three slender octagonal piers,[185] and adorned by rich tracery. As such a festal building or "aula" must we indeed also regard the "Great College" of the so-called University at Erfurt.(Figs. 236, 237 [186]).

Note 186. From my own photographs -- also Gurlitt, C. Historische Städtebilder. Erfurt. Berlin. No date.

It contains in the upper story a great hall in irregular r rectangular form, averaging about 37.0 ft. wide and 104.9 ft. long. At the middle of the longer side is arranged a wide a and shallow altar niche; the whole of one end, as a seat for the body of instructors, is developed as a rich and spirited canopied design, unfortunately now greatly mutilated in its design. A masterpiece of late Gothic architecture is also formed by the main gateway of the building beneath the altar recess mentioned, that is treated most ornamentally with intersecting bands, enclosure by keel arch, figures with canopies and the like.(See art. 232 and Fig. 284).

191. University at Cracow.

In contrast to these universities subdivided into separate groups of buildings, the so-called "Jagelon College" at Cracow, that Casimir the Great founded in the year 1364, gathered

into a connected plan at least a great part of the rooms used by it. The buildings, that we represent on the adjacent Plate in plan, view and section, enclose a rectangular court like a monastery, that is surrounded by an arched portico in t the ground story, over this being an open passage. The different rooms have experienced many changes, indeed most when it was arranged as a university library in the fifties of the last century.

217 The main entrance is found at a on the north side, another being at b, with a passage from the middle to a southern court at c. A narrow stairway at d within the cloister leads to the upper story, like the stairway arranged in the castles of the German Order. The principal rooms have the considerable height of 23.0 ft. Thereby becomes possible the arrangement of an intermediate story over the smaller rooms, and two separate stairways at e and f make accessible the groups of rooms separated by the great hall. It is surprising at first, that besides very few large rooms, the smaller ones entirely predominate. Yet when we see mediaeval audiences represented, we always see but few pupils sitting at the feet of their masters, and must assume, that for many lectures such small rooms sufficed. Certainly we cannot assume, that all the numerous apartments in this building were utilized for purposes of instruction; such richly subdivided scientific pursuits cannot be attributed to a mediaeval university of the rank of Cracow. It is rather to be assumed, that most of these rooms, and probably indeed also the entire lower story afforded living rooms for professors and students. Later and in the 17 th century they were arranged for auditoriums, the names of famous instructors being still attached to many. As for the location of the great hall, we have only conjectures. The hall G is indicated as an important room by a bay window, so that it appears to have the best claim to this appellation. The peculiarly L-shaped hall, that encloses it on two sides, judging from the windows, was indeed built in this form and does not result from a later rebuilding. Again by comparison with other plans (for example with the lower castle in Rüdesheim; see Art. 80), it may perhaps be explained as the dormitory of

the "assisted students".

Peculiar tendencies are presented by the treatment of the roof of the building. In order to protect the upper passage from rain, the main roof has been allowed to project so far beyond the wall of the court, that one-third the roof lies free. After a duration for centuries, the connections loosened, and the ends of the beams bent downwards, so that at the previously mentioned restoration, it unfortunately became necessary to place struts beneath it in order to lessen this impression. Eccentric according to modern conceptions, but entirely corresponding to the rule in the middle ages is it likewise, that each part of the structure has its separate roof, ending in two gables. Over the northern wing lies a roof extending its entire length, whose framework is given in our section. Since its width projects over the open passage around the court, its gable reaches to l on the eastern side. Free beside this rises the rectangular roof of the southern wing extending from l to o, but it stops before the hall on account of a gable roof running from east to west, adjoined by another similar roof over the hall H. Between these separate roofs lie valleys everywhere, that men did not fear in the middle ages. From the modern objections to this arrangement of valleys, men have known how to avoid them on the College Jagellon by extending the ridges of the roofs to the adjoining roofs; but thereby was very unfavorable changed the artistically animated subdivision of the masses of the whole. In the place of the richly grouped treatment now appears the impression of a combined roof, before which are built gables as mere decorations without internal connection.

192. Hospitals.

Great activity was also developed by the middle ages in the domain of hospital buildings. To contend against and protect from disease, men were not capable on account of a low state of medical science, and vast losses in the energy and means of the people arose from the devastating inroads made in the entire West by plague, smallpox and leprosy. But vast misery also previaled within the limits of the possible, and besides the zealous activity developed by the later Orders of monks

in the care of the sick, rich foundations were established e everywhere in order to provide hospitals and refuges for aged citizens left helpless and asylums for the insane. The latter were commonly termed "courts for good people" with a superstitious fear of the name of the chronic illness, and always lay far outside the cities, in order to lessen the danger of contagion by the isolation of the sick. They regularly form simple and entirely rural groups without any special peculiarity in architecture. On the contrary actual hospitals for patients stood within the city walls, or at least close before the gates. Their extensive origin also led to the development of quite peculiar architectural forms.

193. Hospital at Cues.

As such is first to be mentioned the adaptation of the monastery plan to the purpose of caring for the sick, for which the Hospital at Cues on the Moselle presents a good example. (Fig. 238 [187]). It comprises two separate groups of rooms. Adjoining the beautiful church, treated as a small central r room, are arranged the rooms of the nursing brothers together with an imposing assembly hall. West of this the wards f for the sick extend around a great vaulted cloister, two of medium size in two aisles vaulted on columns, and a long hall extending at right angles around two sides of the cloister, in which small cells are enclosed by partition walls. In a simpler plan in the Hospital at Beaune, that Verdier and Cattois reproduce in their frequently mentioned work, the necessary rooms are arranged around three sides of an elongated court.

Note 187. From Schmidt, C. W. Baudenkmale in Trier und seiner Umgebung. Heft 3. Treves. 1836 - 1845.

194. Hospital at Tonnerre.

But a different kind of plan appears to have been preferred, to which with a greater simplicity of the basal idea cannot be denied a certain grandeur. A great hall was erected as t the chief room, somewhat in the style of a monastic dormitory, in which the beds for the patients were either open or separated by low partitions. The dimensions of these walls naturally varied greatly according to the means at command, from

the little hall receiving 5 or 6 beds to quite colossal size.

Perhaps the largest of the plans remaining is the Hospital at Tonnerre in France, erected in 1298, whose general plan we give in Fig. 239.[188]

Note 188. From Viollet-le-Duc. Vol. 6. p. 107 et seq.

A is the great hall for the sick, whose detailed arrangement will be considered later. At one end lies an entrance hall B and a little chapel Z, at the other being a vaulted choir with apse and a side room for holding divine service. This choir contains also the tomb of the foundress, Margaret of Burgundy, Queen of Sicily, sister-in-law of Louis the Saint, and it was separated by a choir screen from the actual sick ward. Thence led an elevated passage, reached by the winding stairway J, to the dwelling F of the Queen. Another passage N led to the dwellings of the nurses and to the kitchens K,M. On the extensive site is then found a laundry at R on the river, as well as the house of the prior at the east of the great hall, who had charge of the entire institution.

The great hall has no less than 61.0 ft. width by 288.7 ft. length. It is covered by a massive wooden tunnel vault and contains 40 cells, separated by low wooden partitions. Above them a wooden gallery extends along the side walls, which makes it possible to watch the patients without disturbing them, as well as to manage the elevated windows. Fig. 240 gives a view of a portion of this artistically as well as practically very important design.

If this mode of building no longer corresponds to our present views on account of the impossibility of isolating contagious patients, it must be designated as entirely unsurpassed in its grand spaciousness and oversight under mediaeval conditions. It also continued until in late times in such appreciation, that even at the beginning of the 19 th century a costly hospital in Vercelli was arranged according to this ground plan.

199. Asylums.

Likewise the institutions for the care of aged citizens needing assistance were preferably erected in this form, of which we possess a very important example in the Hospital of t

Heilig Geist at Lübeck.

The building was already erected in the 13 th century, was later substantially enlarged, and behind its abruptly rising facade with three gables, it combines the entrance hall and chapel in a three-aisled interior with cross vaults. Behind this lies a hall entirely similar to that at Tonnerre and divided into small cells; but to better utilize the space these columns are so arranged in aisles, that the middle of the hall is also occupied. In later times they were changed by an upper ceiling into small enclosed chambers, but were doubtless originally open at top in order to participate in the air space of the hall.

The use of such a "benevolent house" naturally required a series of subordinate rooms, and first of all some rooms for the isolation of sick persons and a warmed room for winter. These rooms in Lübeck are grouped around some courts at the side of the main building.

196. Heiligkreuz Hospital at Goslar.

We give in Figs. 241 to 244 [189] in plan, section and elevation a smaller, but very well developed design, the so-called "Great" Heiligkreuz Hospital at Goslar. It must have been erected in the year 1253, and the Romanesque portion of the side next the street must belong to that time; the interior was indeed restored at a later time, about in the 17 th century, but is still entirely based on the mediaeval customs of living.

Note 189. From Wolf, K. Die Kunstdenkmäler der Provinz H Hannover. II. Reg. Bez. Hildesheim. 1, 2: Goslar. p. 196 et seq. Hanover. 1901.

One enters from the street a great paved hall, the principal room of the building intended for general use. Adjoining it on the left of the entrance is the chapel, only separated by a perforated screen, so that the altar is freely visible from the hall. Along the opposite longer side lie in a long series the sleeping cells of the inmates, 10 in number and averaging 7.4 × 13.1 ft. in dimensions. They occupy but one half the height of the hall; hence another series of such cells is arranged above the lower one, and is made accessible by a narrow gallery with a stairway lying at the rear. No p

provision exists for warming the cells or even the hall; thus for comfort in winter was required a warmed room as a common assembly room. It is now found, restored in the most tasteless modern way, in the space enclosed by single lines at the rear end of the hall. But it also existed at the same place, perhaps in smaller dimensions. If for the winter period was thereby required for the inmates the comfort then usual, for enjoyment of the fine season of the year the garden was available, that is found behind the building, and is made separately accessible by a gateway.

It may perhaps become wearisome, if we always emphasize the same point of view; but it is still not superfluous to show, that even for these buildings devoted to the care of the sick and needy, the ancient German idea of the hall retained its predominating influence until the close of the middle ages. Since we can also observe the same condition in the other domains of our representation, then arises the opinion, that in spite of the confusing variety of the separate cases, the middle ages still enjoyed in its architectural ideas a great restraint and unity. While in this respect the relative adoption of novel ideas appears more today, the ancient masters t took more pains to treat the details of forms and the workmanship in the most careful manner.

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II. Development of the Exterior.

197. Similarity of the Bases.

Existing buildings have represented to us the course of mediaeval domestic architecture, so far as it was determined by the purpose of the buildings, and therein has appeared necesarily a grouping in different divisions, according to how the varied requirements of the separate classes made apparent their distinct influences. In this general arrangement of the buildings and in their grouping, there reigns for the mediaeval masters no basal theory or school traditions, but each separate building was treated as an independent creation with the freest regard to the special conditions, as the practical needs and the surroundings determined.

That entire rows of buildings bear a strong similarity of appearance to each other, this was merely that the entire number of individual structures originated under entirely similar conditions and served for absolutely the same purposes.

Then indeed from such uniformity of problems and similarity of appearance arose a certain tradition, which caused men to adhere to certain forms simply as self-evident, without thinking whether they might be also somewhat different. We have also previously referred to this directly and indirectly. F From the power of tradition is indeed derived the maxim, that under what conditions conclusions should and must be deduced from later structures, as to such earlier works that no longer exist, or in regard to the original form of such as come down to us in mutilated shapes. Likewise depends upon the c community of traditions the conformity in the works of each local architectural group, and on their diversity the differences of the separate schools and their circle of forms. Particularly the local schools have become the transmitters of every appearance, that certain parts of the buildings have become so fixed after long natural use, that in the eyes of the architect, as well as in those of the owner and of the entire people, as to become entirely self-evident, and in consequence of the force of custom, were everywhere employed, after t their special real significance had long disappeared.

198. Determination of the Proportions of the Masses on a Mathematical Basis.

However, somewhat differently from the conditions, which always produced a great diversity in certain separate groups, did it occur in those relating to the detailed treatment of the forms. For the latter, with entire freedom in the different cases, there results a still more unified structure, changing more in time than in country, and it comes next to seek therefor reasons of a general nature. As one such cause has frequently been taken the existence of definite rules for determining the proportions of rooms, in which is taken as a basis, that certain trade directions of the latest middle ages prescribe definite dimensions as models, and that it is possible to insert in the drawings of old buildings a number of parallel lines or equilateral triangles. We cannot allow any importance to this very theoretical assumption. Therefore, that the previously mentioned trade rules of beauty afforded no support for the mode of working in artistically creative lines, is no doubt possible. They form merely a torpid remnant of independent artistic life, a guide for those unable to find suitable proportions of the masses by their own feeling. They certainly were not much employed and assuredly not in general. And the attempts to prove that certain proportions of triangles determined the proportions of the sections and elevations of mediaeval structures, suffer greatly in their means of proof, because in the lines inserted in the drawings, the height dimensions were sometimes fixed, including and sometimes excluding the plinth and impost caps. Sometimes the heights to the crown of the arch or only to the springing lines, sometimes between the axes of the piers, or including the widths of the piers, or merely the clear span of the openings.[190] It is to be remembered here, that the usually careless construction of mediaeval buildings, and still m more the inaccuracy of most measured drawings afford no proof whatever, that these are arranged in reality as they are on paper. But from the artistic standpoint there is in the high estimation of such systems of lines a recognition of what they may indicate in general for the effect of a building.

Note 190. For example, compare in Viollet-le-Duc (vol. 8, pages 540, 552) the production of the proportions of the masses of S. Sernin in Toulouse, in which the freedom mentioned

is striking, that such different proportions, imperceptible to the eye, and likewise never noticed as contemporary, such as those between the total width of the five-aisled interior to the height of the center ridge of the roof (*), and that the proportions in heights of the two main cornices of the two side aisles should have been designed after the proportions of an equilateral triangle.

The production of good proportions in space and area is not as simple as the author of this opinion believes. Besides t the mere masses, a multitude of other particulars play the g greatest part. Perspective foreshortening and the influence of adjacent portions of the building, the arrangement of the lighting, the separation of certain parts by color or members, the refinement or rudeness of the details, the continuous course of the lines or alteration of their directions etc.; almost infinite is the number of such influences, which must be considered by the architect in his creations, and which he c can employ at will, in order to essentially change the effect of the mere proportions of masses, indeed even to annul and change them to the opposite. Certainly the trained human eye, like the ear, has enjoyment in simple and systematically repeated proportions of the masses, even involuntarily so, just as one musically gifted strikes the corresponding intervals correctly, and the creating architect will make such proportions of the masses appear in his works.[191]

Note 191. The author was himself surprised some years since by the number of continuous lines, that could be drawn on an earlier design, made without any such intention.

But just as little as a melody is produced by the intentional computation of the number of vibrations, so little do we believe, that the introduction of the proportions of triangles has ever exerted a substantial influence in the field of architecture. Likewise in this case is the artistic creative
25 power at all times infinitely richer, than the theories derived from its works, and therefore continually limping after them.

199. Importance of Training of Artisans.

On the contrary, the greater importance is due to the influence exerted on the form treatment of the middle ages by the

method and skill in the handicrafts as a general and uniform tradition, less affected by regional peculiarities. Not in the sense, that one should therefore designate mediaeval art in a decided sense as a tradesman's work, i.e., aimless and thoughtless practice, as often popular in a superficial misunderstanding. In the middle ages the artist did remain dependent on the mysteries of the trades; but while he possessed complete mastery over all methods of the tradesman's work and a mature knowledge of the peculiarities of materials, there was for him his regard for the self-evident basis of the development of his own bold and often startling art ideas. That the material was treated, not in accordance with preconceived and abstract school rules imported from abroad, but that just from its perceptible peculiarities and the mode of its use, were derived the incitement to the continual advance in the treatment of forms, in this we see the soundest basis for the artistic creation of the middle ages. If we consider therewith, that this "artisan's" bases were firmly held also by the art of the Renaissance as an inheritance from the middle ages, about which the scrollwork of historical and esthetic theories and abstractions but loosely played, so that its value may scarcely be too highly esteemed. Therefore we also make the artisan's division of the different structural works the basis of the following description of the development in the details.

Chapter 4. Treatment of the Wall.

a. Wooden Construction.

200. Different Methods of Construction; Log Buildings, Half Timber Work.

The architecture of the Germanic peoples, which as already stated, supplied the impelling forces for the domestic architecture of the middle ages, at the beginning was almost entirely based on the use of wood for all supporting parts. Existing in nearly inexhaustible quantities, easily wrought and decorated with simple tools, it so conveniently offered itself for the erection of comfortably warm and even important structures, that in the construction of dwellings, particularly of citizens and of peasants, its predominant role extended far beyond the limits of the middle ages. It may then remain undecided in what form wood construction first occurred; whether as log construction with walls laid up with trunks more or less wrought, or as half timber work, between whose artificially joined timbers the panels of the structure were added in a different structural material -- earth, brush, or later masonry of split stone or bricks. The predominance of lok c construction in the Scandinavian North with its very ancient conditions and also in the East of Europe, less affected by later development, as well as many descripitions of old halls of chiefs, may speak for a very high antiquity of this mode of construction. On the other hand, the excavations teach us, for example the settlement at Grossgartach treated in Art. 4, that already about 2000 years before the period treated here, men understood how to build walls of brush and earth, woven between stronger posts. Thus one might assume, that both modes of construction were perhaps separated in different countries, and were invented at the same time and were further developed, wherein the greater or lesser abundance of wood and the different climatic conditions of the various regions may have determined the choice of either method of construction.

201. Decadence of Log Construction.

Meanwhile in the further course of development log construction everywhere receded before half timber construction, which may well have been connected with the gradual disappearance of the great forests. Thus log construction generally vanished

entirely from the domains of mediaeval art works. Also from the perishable nature of the material has disappeared everything erected in log construction, and we see from the often richly carved works of Scandinavian art, but which mostly belong to the domain of the church, that the half timber work alone prevails in the construction of the houses known to us in the artistic wooden construction of the middle ages. For the very important and beautiful wooden architecture of the Alpine lands must here be left untouched. It must remain undecided, whether its treasure of forms, as many prefer, is b based on primitive traditions, regarded by many as aboriginal Teutonic, and by others are connected with the somewhat enigmatical aboriginal people of the Rhaetians. It is here determinative for us, that the existing buildings do not go back before the 16 th century, and assumed conclusions on the kind of their mediaeval predecessors are not made possible.

202. Earliest Half Timber Construction.

But even the half timber structures of the earlier times h have no existing remains, which belong to the epochs of the masonry construction of the Romanesque and early Gothic periods. If we desire to attempt to represent again mentally to ourselves the wooden architecture of those epochs, these must be in proportion to what is sparingly preserved to us from t the 14 th century, more abundantly from the beginning of the 15 th century, we must regard as filled with plain severity, still strongly contending with structural difficulties and without the rich ornamentation by carving, that men love to employ according to northern examples, in modern creations as characteristics of the "Romanesque" style. A peculiar form expression in wooden architecture cannot have developed itself then; we may conclude from this, that just the earlier remaining buildings are devoted to the plainest forms with t the avoidance of all carved ornamentation and with a remarkable adherence to the details of stone architecture. For this compare the pointed arched windows and doorways in the ground and second stories of the house represented in Fig. 139 and the mouldings there used. On this in particular are found no remains of Romanesque traditional forms, which however have abundantly remained in other branches of the art industries

of the 14 th century. Without basis indeed is also the widely extended assumption, that to the oldest buildings is peculiar the use of particularly large timbers; for even in this respect a sequence of epochs is not at all to be determined on the buildings remaining to us. The very old house just m mentioned does not even exceed in the main supporting posts the dimensions later generally common; the timbers composing the walls of the upper story are characterized by even unusual smallness. And in contrast to it are abundant late works, s such as the House of the Butchers' Guild at Hildesheim, on w- which especially large timbers were employed, in order to impart a new charm in the sense of the late period to the forms already less used. In the decision of this question, it is to be considered, that in the earlier times perhaps larger t timbers were at command, but that with them also the difficulty of working, as well as that of transportation to the site were materially greater, but the means at hand were mostly less.

Note 192. After Schafer, C. Holzarchitektur Deutschlands. Berlin. 1889 --.

203. Corbelling of the Stories.

In the general design of the wall, a very prominent characteristic almost regularly forms a sharp difference between h half timber and stone construction; this is the corbelling of the upper stories beyond the lower ones. Not as if each layer of floor beams was absolutely utilized for such a "projection?"
218 The examples given on pages 141 and 149 have already proved to us, that the addition of an upper story was probably formerly effected by framing in an intermediate beam, rather than by placing a separately built "story". This method of construction maintained itself frequently in peasant architecture until modern times, and also in citizens' houses until deep in the Renaissance period, as examples of which may serve the houses from Osterwick in Schäfer's work on "Die Holzarchitektur Deutschlands", [193] as well as the corner House with bay window in Bäckerstrasse at Goslar from 1612. It is likewise found in upper Germany as well as in the Rhine lands, therefore we have no reason to regard it as a mark of influence from lower Germany, but view it everywhere rather as the ancient remnant of an earlier mode of construction, as well as the

mode of building represented on an example in Art. 138 (Fig. 152), where the floor beams are intersected by these long posts. By the continuous surfaces of the two lower stories, it affords the artistic advantage of a more animated contrast between the animated forms of the upper corbelled story, and this indeed afforded opportunity for the imposing form of peasant's house, such a favorite in lower saxony, and particularly in Brunswick, where over two vertical stone lower stories, a richly treated upper story represents the massive crowning of the wall. Yet in time the developed domestic architecture treats the houses, in which each story has its separate cornice intersecting the vertical posts, as a rule and for the g greater number.

Note 193. Berlin. 1889 --.

Note 194. From Bickell, L. Hessische Holzbauten. Marburg. 1887.

Note 195. From Pfeifer, H. Holzarchitektur der Stadt Braunschweig. Berlin. 1892.

Note 196. From Hanftmann, B. Hessische Holzbauten. Marburg. 1907.

204. Cause of Corbelling.

Concerning the reason for this projection of the upper story, various differing conjectures have been made. Men have desired to derive their persistence from the corbelled galleries of defensive towers furnished with holes in their floors, as if the citizen in a peaceful quarter of the city always h had to consider the defense of his house. Clearer is already the reason, that the projecting external wall was to oppose the internal loading of the beams. Such a projection would be technically correct, and might indeed be attributed to the experienced masters of the middle ages; but it still appears against this explanation, that the corbelling appears almost entirely on the walls visible from the street and scarcely e ever next the court, where it would have served the same statical purpose.

Another practical advantage of the corbelled framework is obtaining space for the upper story, and this purpose was certainly influential in the origin of such widely projecting upper stories, as on the house in Marburg, as well as for the

frequent repetitions of the projection, as it so limited the clear width of the alleys, especially in South German cities, that it had to be restricted to a definite amount by the rules of building officials. But to regard it as a generally valid reason for the creation of the form in question is again favored by the fact, that the rear of the buildings so seldom exhibit the projection, and also that it was rarely employed f
220 for the more valuabel lower stories, but always for the less useful for the upper warehouse stories.

Therefore we must regard the most important reason as its beauty, to which this preferable form owes its general use. It forms the most effective decoration and subdivision of the half timber work, derived from the mode of construction of w wooden architecture.

205. Development of the Story Cornices.

Fig. 245 exhibits a section through such a cornice of the simpler kind. We see in that the plate of the lower story A, in B the ceiling beam projecting beyond the external wall, s simply rounded at the end and having a narrow chamfer. It is supported by a curved and hollowed strut, and it supports flush with its outer end the slightly moulded sill C of the upper story. (All projection of the end beyond the face of the upper story, and not protected from the weather, forms a structural defect as a dangerous place for the effect of wet. Such unbeautiful forms have only been adopted in the 19 th century from a misunderstanding of the mediaeval treatment). Between plate and sill is formed an interspace, which in our example is closed by an obliquely placed board, inserted in corresponding grooves in the beams. Instead of this is also found in a simpler treatment a solution, in that the earth f filling of the ceiling, that occupies the entire height of t the beam, ends vertically at about the rear face of the sill C, thus being connected to the latter. For projections of a
221 about 1.3 ft. or more, such a horizontal extension of the internal earth covering could not occur; it was then frequently covered by boards, though not always so.

Meanwhile such wide projections are exceptional. The distance between plate and sill is chiefly limited to the dimensions of the usual sections of the timbers, and it was filled

by pieces of wood inserted in a vertical groove in the beam. These wooden pieces were regularly profiled, in plainer structures so that the profile, perhaps a simple cavetto, stops s sidewise against the surfaces of the beams. But generally t the profile changed into the rectangle before each beam by a rectangular recession, by a curved or beveled ending. (Fig. 246 (192)). Such an entablature then indeed projected 1.5 to 2.3 ft. and produced by the bold recessions extremely animated and rich effects, that by the selection of very imposing dimensions of timbers, particularly in lower Saxony, frequently attained great monumental importance. To such enhancement substantially contributed the use of head bands of corbels under the ends of the beams. These were also sometimes more or less richly ornamented, rising in straight lines, cut out in segmental or richer profiles, and decorated by surface ornament or by rich figure carvings. But in the middle ages they were strongly directed outward with an inclination of 60° or more from a horizontal. In order to arrange them, it is naturally required that the ends of the beams should be just above the wall posts.

Note 198. From Uhde, C. Braunschweigs Baudenkmäler. 2 nd edition. Brunswick. 1893.

The ends of the beams are cut off smoothly in simple structures, and are only effective by their bold projection, thus forming the first points at which any ornamentation is added. They were rounded off at the lower angle, this being with the chamfering of the angle or the return of the rounding at the sides. Richer effects were obtained by combined mouldings, but consideration was paid to the undiminished strength of t the end of the beam. Therefore supporting corbels were inserted in deeply sunk cavettos, and these were utilized as decorations by carvings, a very decorative play of forms being d developed there. (Fig. 247 and the other representations of half timber structures).

Note 199. From Schmitz, W. Der mittelalterliche Profanbau in Lothringen. Düsseldorf- Pl. 54. N.D.

206. Angle Forms.

These forms of cornices arose in the most natural manner on the longer walls of detached houses, where rest the ends of

the transverse beams. With its strictly limited use is developed the form treatment of half timber construction in the c clearest and most surprising manner from the structural purpose and the nature of the building materials. But the beauty of form already had led to its use in a less severely consistent manner. This was also employed in narrow gabled houses in blocks, in which the beams were naturally parallel to the street, and for detached or corner houses, this was preferably continued around the corner. The means for this was the arrangement of short jack beams, which rested on the plate a and were tenoned into the nearest entire beam, as may be seen for the roof beams in our representation of the house at Münster in Fig. 152.

This produces an entirely plain solution in the plane front surface; but at the angle the difference between the last beam ends and the angle jack beam is great on account of its w width.(Fig. 248 [195]). Therefore two false jack beams are tenoned into the angle jack beam and are supported by corbels. (See the arrangement sketched in Fig. 249 [196]). When these beam ends with their corbels meet thus at the angle beam, a corner solution is produced, which in spite of its incorrect construction still makes a very strong and satisfactory impression on the eye. It should be mentioned, that the necessary use here of quite short jack beams, supported only by end tenons and brackets (without bearing on a plate), was later transformed to the corbelling of entire fronts, whereby the sound
223 basal principles of form were indeed strongly infringed.

Note 200. From Pfeifer, H. Holzarchitektur der Stadt Braunschweig. Pl. 6. Berlin. 1892.

207. Plate and Sill.

As the upper termination of the wall, the plate remains without ornamentation as a rule; it seldom receives a moulding of slight projection. As usual in the Saxon provinces, in c case the beams rest directly above the lower posts, its architectural importance is then limited to bordering at top the panels of the framework, and to holding together the posts as a termination. Therefore it is occasionally replaced there by a flat plank, through which the tenons of the posts extend into the beams. An essentially more important part is played by the sill of the upper wall. To it are first attached the

ornamental accessories next the beam ends, and in favor thereof, it generally requires very important dimensions, especially in height. We have already mentioned its pretty rich mouldings. Their effect is increased by their projection from t the face of the sill in offsets or in segmental arches, and thereby surfaces are enclosed, which are preferably utilized for ornamental and figure carvings. In other cases the bottom of the sill is beveled and cut in the surface is a slightly sunken band of scholl work, inscriptions or blind tracery. (Fig. 251).

Note 201. From Lehmgrüber, O. Mittelalterliche Rathausbauten in Deutschland. Pl. 1, Figs. 1, 2, 3. Berlin. 1905.

Note 202. From Schmitz, W. Der mittelalterliche Profanbau in Lothringen. Pl. 60. Düsseldorf. N. D.

224 208. Window Sill Belt.

Further for the expression of very necessary subdivision, the half timber construction receives at the height of the w window sill in the better buildings a belt, and this timber is accented above the remainder of the woodwork by a projecting moulding. It is then halved into the posts and struts, while as a rule, the girts flush with the surface are tenoned into them. In the late period, this projecting intermediate belt was properly replaced by members, let flush into the framed members, and accented by projections on the vertical posts. (250 [197]).

209. Struts.

Essential in the appearance of the whole are likewise the struts, that have to ensure the framework against distortion. In North Germany, where it was especially liked in the cities, in order to open the entire width of the house in windows, t the struts are mostly restricted to the spaces below the windows. In the simplest case, they take the form of steeply inclined basal struts; from this was then readily derived struts forming triangles, which entirely filled the angle between s sill and post. The wooden surfaces there obtained afforded a favorable and frequently utilized opportunity for ornamentation by carving. One of the richest examples from the Reichsstrasse in Brunswick is reproduced in Fig. 251 [198]. These f form the transition to finally covering the entire **rectangul-**

rectangular surface with planks and with carvings, a rich arrangement, which was greatly favored in the Renaissance period. Besides this ocurred in these regions a very common endeavor to have a continuous series of X-braces. At the corners of the houses then indeed are also added longer wind braces, that extend for the entire height of the wall. In South Germany as a rule, the windows were more freely distributed in the e enclosed surface, the posts were placed farther apart and less regularly, thereby obtaining space for a more extensive stiffening of the wall by longer braces at top and bottom, that men liked to set in pairs beside each other, and attached to the timbers to be stiffened by means of a dovetail lap (Fig. 252 [197]). In the predominating use of this lapping instead of the simple tenon fastened by a wooden pin, many see a difference between "Swabian" and "Franconian" half timber construction. In reality in Franconia as in Swabia are so many e exceptions to the rule here stated, for example, see the Old Palace at Bamberg in Fig. 119, that its validity is thereby very much restricted.

Note 204. From Viollet-le-Duc. Vol. 6. page 266.

Men liked to use crooked and curved struts for all this bracing; on the contrary, it is seldom found before the entrance of the Renaissance movement, that the outlines of the braces
225 were animated by cutting out in the form of trefoils, quatrefoils and the like. First in this time of the rich later style, that is still entirely based on mediaeval ideas of form, were preferably employed pieces of trunks, cut into curved forms and ornamented by cusps, and the forms were likewise enriched by a series of the frequently interpenetrating crossed braces.

210. Windows in Half Timber Construction.

The window openings were left plain as a rule, only being accented by the recession of the glass surface from the outer face of the wall. For the window leaves were originally almost everywhere attached to the inside of the wall and swung inward; it was a later change, when for a better closing, they were transferred to the outer plane of the wall and opened o outward. The opening was seldom enclosed by an angle moulding,

which was then extended along the sill with square corners, but on the contrary it was rounded at the upper angles. Only in the late epoch was the upper window lintel cut into the form of the ogee or curtain arch, when the moulding enclosed the opening; more rarely was the upper termination cut blind in the very high window lintel. (Fig. 253 [199]).

211. Doorways in Half Timber Construction.

On the contrary the doorways in all times received the richer form of the arched top and a decoration by carved angle m mouldings. The apex of the arch was then regularly cut in t the lintel, either blind, as on the Münden House in Fig. 152, or cut out in low form. The sides of the arch were cut in s solid corbels or head pieces. Fig. 204 [200] plainly shows the jointing and forms of the work on a late Gothic example.

Note 204. From Old English Country Cottages. Extra number of the Studio. page 73. London. 1906-1907.

212. Half Timber Gables.

Above the walls treated in this manner, the gable generally rises in a flat plane without further corbelling. The ends of the internal purlins are visible on it and determine the places of the main or connecting girts. They mostly project from the surface of the gable roof only by the thickness of the rafters; but occasionally they are carried out farther, in order to support a strongly projecting gable. (Fig. 143).
226 But also sometimes even in the gable the different stories w were accented by corbelling the plates; then in each story a series of vertical posts must be tenoned into the last plate.

213. Roof Cornice.

Along the longer sides of the house, the arrangement of the roof beams frequently extended in a manner entirely similar to that of the lower cornice. (Fig. 255 [201]). Since in the shadow of the eaves of the roof, this richness of form would however be less effective, men were usually satisfied by cutting off the beam ends obliquely, covering them with a painted or plainly moulded board, from whose upper edge the eaves of the roof projected only a few inches.

214. French Half Timber Work.

German half timber construction developed even till the decadent epoch of the late Renaissance its rich form life within

the limits and in the closest connection with proper construction, and it thereby obtained the advantage of a national, c clear and strong, sound appearance. A different development is shown by the wooden architecture of France and of England. The former is derived from arrangements entirely similar to those of German art and perhaps exceeds this in age. Certainly the dates of the different works are not fixed; particularly must one regard the representations of houses of the 12 th century given by Viollet-le-Duc in his magnificent work, the Dictionnaire de I'Architecture Francaise etc., rather as products of conjectural restoration than as historical evidence. But in the proper framing in France were quite early mixed m mere forms without structural meaning, as for example in Fig. 256 [202], of small shields of arms carved from the solid wood of the posts, the corbel supports of the window belt, as well as the projecting sill. In the later time was developed here a tendency to graceful elegance of appearance, that shows itself in the accenting of the vertical timbers, in the suppression of the strong projections of the entablature, and in the addition of graceful carvings imitated from late Gothic stone forms. (Fig. 257 [203]).

215. English Half Timber Work.

In England half timber work apparently at first pursues a rather tasteless course in purely structural construction. On the contrary in the late period, at the entrance of the Renaissance movement, theee broke out in opposition thereto the desire for fancifully varied ornamentation of the surfaces, and men cloud not employ themselves sufficiently in the use of oblique continuous lines as well as of curves, and by the sawing of the forms from timbers. We give an example belonging to the more moderate tendency, a country house in Shropshire in Fig. 258 [204].

b. Masonry Construction.

216. Advance of Stone Construction.

Stone construction, as the later acquisition in comparison with wood construction, came into use in the different countries at quite different times. From the Romanesque South and Romanized Gaul, it extended very gradually toward the North and East, at first naturally for church buildings and monast-

monasteries, by means of their traveling relations with the South. Only later did it occur in actual dwellings, and this may be explained by attributing its use to the emperors and the bishops. Characteristic of its part is the statement, t that a stone house, which bishop Alebrand erected in the year 1036 at Hamburg, so aroused the envy of duke Bernhard of Holstein, that he decided to build a stone house likewise. Stone construction of dwellings long remained a privilege of the g greatest men and also of public buildings; first in the 14 th century the strengthening of the citizen class and the care
227 for safety from fire in the cities required its general use for citizens' dwellings; but even then still more in the great settlement cities of the East; Lübeck, Stralsund, Thorn etc., than in the cities with already older traditions in middle a and Southern Germany.

217. Split Stone Construction; Stucco Coating.

As a building material in the simple conditions of the early time, split stone played a greater part than ashlar masonry, requiring greater manual skill, and therefore it was also occasionally left with its effective rough surface. This is to be assumed in the indeed rare cases, where by reason of herring-bone courses or even by rosette combinations of blocks of different colors in the coarse building material a certain o ornamentation was produced. But if in any manner architectural members in cut stone were inserted in the split stonework, and indeed generally in the later time, men were accustomed to ensure the effect of these finer members by covering the rough split stone masonry with stucco. As a rule, this then extended over the irregular jointings of the dressed stones so far, that it followed the outlines of the principal forms at uniform distances. On buildings, which have yielded to l later transformations, it may be plainly recognized, that the surfaces to be covered by stucco were prepared by being roughened. Both the mere open jointing as well as the roughcast, by which one now endeavors to produce an antique impression, do not correspond to mediaeval building customs. Only one occurs; that with irregularly rounded materials, -- granite, b basalt pillars etc., -- the entire stone was not covered by stucco, but in certain parts this was permitted to project

from the stucco, but then segular masonry joints were incised in the stucco, which with the white color became strongly apparent, and thus gave the split stone masonry a regular appearance, almost recalling ashlar work. The stucco was as thin as possible in all cases, indeed being applied during the construction of the masonry and smoothly shaped with the trowel; in many places this troweled stucco was smoothed almost to a polish by coating with pure lime paste at the same time. Such carefully treated surfaces thereby acquired an expression, t that they did not represent perfect planes, like the modern stucco applied with the brush and straightedge, but it possessed a certain animated movement from the use of the trowel.

218. Ashlar Masonry.

By this method -- cut stone for the angles and all architectural members -- with split stone masonry elsewhere, most South and West German houses were erected. Pure ashlar structures are more rarely found in Germany, but on the contrary a are abundant in the buildings of the rich French nobles. Ashlars with bosses appear in Germany frequently in the epoch of the Hohenstaufens, at the close of the 12 th and in the first half of the 13 th century, then also for example, in Nuremberg again in the 14 th and 15 th centuries; but with rare exceptions, they serve more for the impressive treatment of defensive structures, than for actual dwellings.

219. Brick Construction.

In place of the lacking natural stone in the North German lowlands and in Eastern middle Germany, burned clay was frequently employed as the building material. Its artistic effect substantially depends on the freedom, both on the frequently varying and scarcely ever uniform coloring, as well as the t treatment of the bonding of the surfaces. The depth of the effect of color was freely animated by the arrangement of sm-
228 all surfaces of stucco, or by the use of glazed bricks. This use of glazing was at first limited to certain architectural members, especially decorative arches and friezes; but it then extended to the surfaces and covered these with uniformly and closely placed bands or large lozenge patterns (Fig. 259 205), to which was then added also the enclosing of the angles by glazed bricks. The unity of the surface was thus preserved

in every case, and hard endings were avoided. In certain cases, thus on the extension of the City Hall in Lübeck and elswhere, the entire facade was composed of glazed bricks. A l less favorable effect was produced, if merely the openings w were enclosed by glazed bricks, which more rarely occurred. Almost never were combined glazed bricks used for subdividing the surface or as a cheap substitute for moulded members, and
221 this for good reasons. The color of the old glazing is mostly brown or blackish green. It was evidently made from crude materials, impure in a chemical sense; therefore it shows with much advantage to the artistic effect, not the uniform coloring of a lacker coating, but a play on the different bricks in often quite different tones.

Note 205. From Steinbrecht, C. Preussen zur Zeit der Landmeister. Fig. 87. Berlin. 1888.

c. Painting of the Exterior.

220. Painting of Brick Buildings.

More commonly than is generally assumed,,painting in colors also covered the exteriors of houses. Brick buildings were frequently coated with a dark and strong red from top to bottom, generally without any attention to the joints, and from the quiet background of this covering or the brick surface w with dark joints, the members of the cornice and the openings were relieved in animated colors -- white, black, Schweinfurt green and yellow ochre. On the Southern gable of the City H Hall at Frankfort-a-O, which must date from the beginning of the 14 th century, a simpler mode of accenting the architectural members has been preserved; the tracery of the great rose window and of the horizontal frieze has been painted black, and that of the panels of the piers a snowy white by coating with thick limewash, the latter being further accented by covering the stucco ground behind it with a dark gray color.(Fig. 260 [206]). To this painting of the parts in brickwork is then further added everywhere the very extended painting of the s stuccoed panels with all sorts of ornaments, particularly with tracery in bold red and black colors, and with strongly colored shields of arms.

Note 206. From the Author's Drawing.

221. Painting of Stuccoed and Cut Stone Buildings.

221. Painting of Stucco and Cut Stone Buildings.

Likewise in stucco and cut stone construction the middle a ages did not recognize the duty now understood, to freely show the building materials employed, but everywhere unconcernedly resorted to color, where it seemed artistically desirable. Stucco generally received the clear ground tint; then m men liked to paint the angle ashlars and the accompanying lines of the projecting architecture, with entire friezes on t the light surfaces. Similarly as in brick construction were also certain parts here contrasted with the surfaces, window enclosures etc., as animated and more richly colored. With greater richness of means, figures were also not rare on the exteriors of buildings in the middle ages. The giant Goliath ona house at Regensburg likewise already had its mediaeval p prototypes, as well as also the representations of saints so frequently remaining from a later time. The wealth of forms in the middle ages continues in such colored ornaments in great abundance; here are shown illustrations from the fables of animals or separate animal forms, there are other figures engaged in various affairs, and everything conceivable and inconceivable is utilized for the decoration of the walls of the house. For the application of this ornamentation was already developed in the Gothic period the process of sgraffito. Rich late Gothic friezes executed in this mode were found on the Canons' Building at Freiberg in Saxony, and rich Gothic architectural motives on a house at Eggenburg in lower Austria. The method came to a freer development and wider use, p particularly in Bohemia and Silesia, indeed first in the time of the early Renaissance.

But the lively enjoyment of the colored effect frequently led to the covering of entire buildings with painting. Whether we may transfer directly to the reality the coloring in vermilion red and deep blue, may perhaps at first appear doubtful. But the occurrence of such colorings on walls is certain in interiors. And if especially in late French Gothic plain ashlar surfaces are sprinkled with small fleurs-de-lis in relief, and if we find the porcupines of Louis XII and similar motives scattered in relief like fabrics over the surfaces, the thought appears, that these shields of arms and also

the surfaces ornamented by them were painted in similar colo-
rs, and that as men manufactured fabrics with heraldic patte-
rns for garments, the house facades were also painted in her-
aldic forms and colors, whereby the splendid blue or red bec-
ame predominant in the appearance. proofs of this mode of t
treatment are indeed not perceived. But we more commonly fi-
nd entire stucco or ashlar surfaces coated by uniform light
red or gray as well as yellowish colors, and then mostly cov-
ered by a regular network of white, black or red ashlar join-
23/ ts, painted without regard to the actual jointing. Likewise
conventional representations of ornamental ashlar work frequ-
ently occur. Cornices, window and doorway enclosures etc.
were then often accented as decorative parts by animated pain-
ting, thoroughly as previously stated of brick structures, b
but in richer coloring, when vermilion red, ultramarine and
light blue, as well as gold were added to the colors there m
mentioned. It is there a ground principle, that the coloring
of the members in relief is strengthened, in that in general
the projecting parts are lighter, the grounds, cavettos etc.
being painted darker. Fig. 261 [207] gives an illustration of
the manner in which other painted ornaments decorate the sur-
faces by an example from Strasburg.

Note 207. From Denkmalpflege. 1900. p. 50. For another example, see the same for 1901, p. 32.

The background is here filled by alternating dark red and
yellow squares, which are separated by white bands with black
edges. On the crossings of these bands are square white ros-
ettes with green nucleuses. The window openings are enclosed
by wide light red bands, which are again bordered externally
by a white black-edged band. Following the inclination of t
the roof, a frieze extended along; on a black ground are yel-
low scrolls with white leaves shaded with red. The triangles
of the gable steps bear on a red ground animal figures in wh-
ite and yellow colors outlined with black. In the middle of
the surface treated in this manner was painted a great figure
of the Christ-bearer. (A).

Note A. The terms employed in the text, "vermilion, dark blue, ultramarine", merely denote the animated kind of coloring, but do not state that these colors, as they were, were

applied unmixed. To this widely accepted view certainly corresponds only a very superficial knowledge of the ancient monuments, they have already been much injured by restorations and by new additions. Thorough examination of untouched ancient examples teaches, that the old masters showed a very refined feeling in these things also, and that the splendor of the natural colors was not broken, but that they -- and especially the difficult ultramarine -- were carefully harmonized together by slight additions.

The highest richness of appearance was again produced by t the use of representations of figures, that men loved to employ in combination with architectural panelings. The painting of the gity Hall of Ulm, in part recently restored, is the r richest example on German soil. It indeed first originated in the epoch of the transition to the Renaissance, and in the figure portions is based on models by Burgckmayr, but retains in the ornamental work the conceptions of the late Gothic. Therefore we can with full right still ascribe it to the middle ages, since generally their influence in regard to the o painting of houses did not cease at the introduction of "anttique" forms, but rather later in the distribution of the ornament and in the mode of flat conventionalization was still very influential. Likewise heraldic paintings, which are usually found separately or are arranged as bands, occasionally extend over large surfaces. An interesting example is the so-called Wappenturm in Innsbruck, which no longer remains in i its original form, but which may be seen in authentic representations in the Ferdinandum there. The entire tower was covered by painted armorial shields, which were regularly distributed over all surfaces.

232 222. Painting of Half Timber Buildings.

Some remarks are to be added yet on the painting of half timber work. 206 Likewise for this the application of colors, which should at the same time serve for the protection of the wood, formed the rule, even though frequently the actual color of the wood may have been left visible. But the woodwork and the panels were always different in color, the latter being characterized by a covering of lime stucco and light tints. In countries where men were accustomed to employ small timbers,

particalarly on the Rhine, they liked to draw a thin red or black line around the panel at 3/4 to 1 inch distance from t the frame; otherwise the surfaces remained without painting, or at most received a few slight decorations by lines crossing in lozenge form or small scattered ornaments, which were scratched in the damp stucco by a tool with several points. The decoration extending in the Hesse lands with flower scrolls incised in the stucco and painted, must belong to a much later time, but as a practical and pleasing mode of decoration has a good claim to the revival of it in part in modern times. Thus animated and prominent on these light panels, the structural framework generally receives a coating of strong color, mostly red, in which burnt ochre, caput mortuum, or okblood were employed as coloring materials. Also tar coating was found, and in Rhenish half timber work the somewhat softer effect of yellow was also preferred for this purpose. On the basis of this strong tone the members were then accented by color in the manner before mentioned; but especially ornamental and figure carving was enhanced in effect by graceful painting in bright colors.

As the binding material of colors, lime was always employed in old times for a stone surface. the porous quality of the ground is effective for cut stone, and on stucco surfaces the chemical combination of the lime ground with earth colors sufficiently fastens the colors. Woodwork may also be frequently painted with lime colors, as today for agricultural structures, for which indeed an occasional renewal was necessary. Firmer adhesion was obtained with oxblood (especially for red and black tints), milk or curd colors, and the latter formed the rule for fine works in carving and chiseling.

d. Subdivision by Cornices etc.

228. Plinth.

The wall constructed in such a manner then received a further subdivision by cornices and members of different kinds. The corresponding forms of half timber construction are so c closely connected with the structural execution, that it was not necessary to previously describe them. But in the stone construction of city dwellings, the horizontal subdivisions played no great part. Projecting plinths were often employed,

even in plain forms, but were more commonly omitted, even for costly structures. Occasionally occurred also the use of unusually large ashlars, or otherwise a change of structural m material took place, as may be seen on the elevation of the Monastery of S. Gereon at Cologne in Fig. 262 [209], particularly common in brick regions are some courses of granite boulders used in this sense. The arrangement of plinth mouldings is naturally quite excluded on palaces placed on steep hills, as on the Palace of the Landgrave in Marburg (see Plate next page 80). For such buildings the effect of a plinth is indeed produced by the battering substructure. Slight differences in the level of the site, on the contrary, are usually followed by stepped breaks in the slightly projecting plinth, since men also liked to place cellar windows in the higher parts by means of such breaks in the base, and even doorways in the m mass of the base.

Note 208. See on this point the Essay of G. Lübke in Verhandlungen der VII Tages für Denkmalpflege at Brunswick. Berlin. 1906.

Note 209. From Bock, F. Rheinlands Baudenkmale des Mittelalters. Cologne and Neuss. 1870 - 1874.

224. Belts.

Belt courses never have such importance as in Renaissance architecture. They are often entirely omitted. Also if they exist, they form only narrow division lines on the entirely predominant surfaces. They mostly accent the portion of the window sill, either extending across the entire front or limited to the widths of the windows; more rarely and almost solely besides these "window sill courses", they serve to indicate on the exterior the position of the floor beams or to form a window cap. In the latter case, they preferably extend down at right angles beside the window lintel, whereby they substantially win increased importance. See the window groups in Fig. 313.

Their basal form in the Romanesque period is a thick slab, whose lower angle has some sort of moulding, a chamfer, cove or round, and it may then be decorated also with ornament. In the Gothic period the usual wash is the prevailing form, affording opportunity in its bottom cove for plant and figure

237 ornamentation. (Fig. 263 [210]). Instead of belts, particularly in brick architecture, also occur bands, that without projecting from the surface of the wall are emphasized by glazing or painting, making possible a very bold subdivision of the wall surface. (Fig. 260).

Note 210. From Lutsch, H. Kunstdenkmäler der Provinz Schlesien. Text volume. Breslau. 1904.

225. Main Cornice.

The principal cornice is also generally not more strongly treated, at most being accented by the addition of a high slab as the support of the gutter. Widely projecting wooden cornices over a stone structure are less favored in Germany than in Italy, but are there handled richly and with charm, where the inclined projecting rafters are doubled and tripled by t timbers placed under them, or where the ends of the ceiling beams are allowed to project horizontally, richly moulded and supported by similarly treated corbels. (See the main cornice in Fig. 335). A strongly projecting stone construction, either by large mouldings or great corbels, was only given to the main cornice, when it was required to support a projecting p passage, gallery, or another projecting portion of the structure. As such an important upper termination, a series of battlements was likewise employed for purely decorative purposes in the most different regions; thus on the so-called Nassau House in Nuremberg, in the City Halls at Kalkar and Göttingen, on the Houses of the Patricians at Cologne etc. If such a row of battlements extended around a detached angle of the building, it was a rule to insert there a small and graceful angle turret for special emphasis. We give in Fig. 264 [211] one of the most charming solutions of this kind from the stone House in Frankfort-a-M, that the rich merchant Johann von Mehlen from Cologne erected in the year 1464; also as a plainer form the termination of the roof of a house from Metz. (Fig. 265 [212]).

Note 211. From a drawing of R. Jung in Denkmalpflege. 1900. p. 29.

Note 212. From Schmitz, W. Der mittelalterliche Profanbau in Lothringen. Pl. 13. Düsseldorf. N.D.

226. Ornaments in Relief; Decorative Anchors.

235 226. Ornaments in Relief; Decorative Anchors.

As a further decoration of the surfaces are yet to be mentioned shields of arms in relief, and the figure or ornamental signs serving for the name of the house, which were freely d distributed, just like the painted representations of a similar kind. A peculiarity of some regions further consists in this, that the iron anchors attached to certain floor beams and purlins to prevent the walls from bending outward, had t their ends frequently visible externally on the walls and gables, then being frequently wrought into rich ornaments. A series of Netherlandish examples are given in Figs. 266 to 272 from earlier drawings by Essenwein.

227. Connecting Arches.

Even if not exactly belonging to the treatment of the wall, there should be mentioned here the fact, that we find in cities the opposite rows of houses are connceted by arches, for the purpose of preventing the facades from inclining toward the street; sometimes the wall of the house may have bent over afterwards. Also the intention to place gates as the ending of certain quarters of the city beneath it, is indeed frequently the reason for the arrangement of such arches, which we find indeed in small German cities, as well as in Italy a and the East. Certain arches of suitable width also served as a bridge across the street for connecting the upper stories of two opposite houses, although it was generally preferred to construct them of wood, since they were more easily removed, if the connection must be stopped. That these arches, frequently repeated in long rows, substantially contributed to the picturesque appearance of the cities, requires no expplanation; their effect for the quiet of the vieu of the city was likewise very valuable, when at the mouth of a side street they continued the course of the main street, and in this sense their disappearance from modern or the modernized ancient cities is strongly to be lamented.

236 Chapter 5. Openings in Walls.

a. Doorways.

228. Doorways of simple Character.

The most important basis for the artistic development of t the ascending masses of the walls is found by the arrangement and the treatment of the openings, the doorways and windows, the first of which we desire to treat first. Corresponding to the very simple and narrow conditions of the ealry period, t the Romanesque doorways of secular architecture are mostly of a modest type. They substantially serve only for the purpose of use; rich ornamentation, such as plays so great a part in church architecture in the artistic preparation for the interior with numerous recessed columns, ornamented enclosures and sculptures, is scarcely found in them. Likewise great doorways, that serve as driveways, are mostly without decoration, other than that afforded by their careful execution. On defensive structures ashlars with bosses were particularly liked for the enclosures of doors. At most was added there to the accenting of the impost line by a cap more or less richly treated, and breaking the angle of the opening by a plain moulding or a single small column. Examples of the simplest kind are to be found on the views of the Palace of the Wartburg (Fig. 56) and on the Monastery of S. Gereon at Cologne.(Fig. 262). A somewhat more elaborate treatment is shown in the p preceding Hefts of this Handbuch (Fig. 141, Ist edit, p. 206) giving an entrance doorway from Salzburg. The doorways, that serve only for persons on foot are strikingly small, according to our current ideas. In this a great part may be played by the practical endeavor for effective and easy protection -- both against enemies, as against injuries by the weather; but it is undeniably also of great comfort of the internal rooms, the feeling of habitable isolation, that is produced by the
237 smallest possible opening in the enclosing walls. Men usually went so far in their restriction of dimensions in the middle ages, even when security and defensibility were not at a all in question, that tall persons could only enter such a d doorway in a stooping position, and they evidently regarded such small inconveniences as unavoidable in contrast to the artistic advantages mentioned. If such small doorways were

spanned by arches, then the imposts of the arch were regularly below the height of one's head, and closed tympanumu, such as are so commonly shown by church portals, are scarcely found. We give a doorway from Castle Landeck, where it is placed in the main tower of the castle at 29.5 ft. above the ground. (Figs. 273, 274 [213]).

Note 213. From Denkmäler der Baukunst, published by the D Drawing Committee of Students of Royal Polytechnic School at Berlin. Division 1. Jubilee Heft No. 26, Pl. 8.

It has a clear span of 2.5 ft. and a height of 5.0 ft. to the crown, and is enclosed externally by ashlars with bosses. The doorway arch is carried considerably higher in the interior, so that a rectangular door found space for closing it. Before the doorway two corbels project from the wall beneath the sill. They indeed supported the timbers of a light passage, that made access possible from an adjacent building, and could be easily destroyed in time of danger.

That the entrance to a rich monastery could also be treated without great ostentation is shown by Fig. 11. The width is about the same, that we now employ for a house doorway; the heavy plinth of the building is carried around the opening a and produces a very massive enclosure.

229. Doorways from Münzenberg and Gelnhausen.

Doorways experienced a richer treatment in the late Romanesque epoch, which served for the access of the public to the imperial and princely palaces. Fig. 275 [214] exhibits the lower entrance doorway to the Palace in Münzenberg, it is covered by a trefoil arch, enclosed by a weak moulding, which passes into the angle at bottom in curved form. One of the richest examples is the entrance doorway to the Palace in Gelnhausen (Fig. 276 [215]), where above a jamb with triple columns a and within an enclosing semicircular arch is found a richly decorated trefoil arch as the upper ending. As a simplified imitation of this splendid doorway appears the middle entrance in the City Hall at Gelnhausen (Fig. 207), again spanned by a trefoil arch.

Note 213. From Naehr, J. Die Burgen der rheinischen Pfalz. Strasburg. 1887.

Note 214. From Moller.

Note 215. From Denkmäler der Baukunst. Published by the

Drawing Committee of Students of Royal Polytechnil School at Berlin. Heft. 1. Jubilee Heft. No. 26. Pl. 8.

230. Smaller Arched Doorways of the Gothic Epoch.

Likewise in the gothic period is the enclosure of the smaller arched doorways by a plain moulding generally the rule. In contrast to the earlier forms, aside from the pointed form of the opening, the mode of treatment is changed to greater grace and directness, as shown by Fig. 277, a small portal of the Franciscan Monastery at Bözen. To this is added in the time of the late Gothic the enrichment resulting from the intersection and penetration of the different mouldings. They occur first at the impost and the crown of the arch, but finally often extend also beyond the line of the arch to a rectangular enclosure, as in Fig. 278 [216], a doorway in the south wing of the cloister at Bebenhausen. Other enrichments are produced by figure or decorative ornaments, shields of arms etc. above the doorway arch of this form, arranged in a separate enclosure as crowning the doorway. Thus at the entrance to the stairway of the City Hall at Marburg, where in the lower field of the addition appear the city arms and the name of the city supported by an ape, above being the arms of the landgrave, protected by S. Elisabeth, in splendid and animated modeling. (Fig. 279 [217]).

Note 216. From Paulus, E. Z. Die Cistierzienser Abtei Bebenhausen. p. 130. Stuttgart. 1886.

Note 217. From the Author's drawing.

231. A quite peculiar form has then resulted in many German cities from the custom of sitting before the house doorway after the completion of the work of the day, to exchange greetings and talks with neighbors and passers. In many and especially the north German cities, this led to the arrangement of raised seats before the house, the so-called stoops; elsewhere a and particularly in upper Saxony, small semicircular seats w were sunk or recessed in the sides of the doorway. The older form may be that, which we find on the so-called Provost's House of the Cathedral at Meissen (Fig. 280 [218]) with seat niches recessed in the wall beside the portal. This entire design of the doorway otherwise gives us a representation of the rich and very developed form world, with which late Gothic

art undertook to solve such new problems shortly before the appearance of the Renaissance, and probably already aroused by its competition.

Note 218. From the Author's drawing.

But it was more commonly usual to combine the seat niches with the jambs of the doorway, as appears on a house at Naumburg (Fig. 281 [218]), which bears the date of 1520 for its erection on the impost stone on the right side, garcefully sculptured in the form of a canopy.

232. Larger Arched Doorways.

Besides the arched doorways open for their entire height, toward the end of the Gothic period are also occasionally found portals of greater width with closed tympanums. But they differ from the similar church portals in that, the middle p pier, indispensable in the latter, must be omitted, to make it possible to drive through. Consequently for the larger f
240 free spans the unreliable horizontal lintel was replaced by the segmental arch.

Fig. 232 shows one of the arched doorways, such as Hans Behaim created about the year 1500 on the City Hall in Nuremberg and on the so-called Imperial Stables, an old grain storehouse. The doorway of 7.5 ft. high is enclosed by a broad moulding, that is arranged to produce the richest intersections of its rounds, almost lying in a single plane (Fig. 283). Likewise the accenting and graceful development of the lower portion is characteristic of the art style of that time; of the extremely fresh and animated treatment of the shields of arms represented on the tympanum, one small illustration can scarcely afford a sufficient idea.

More imposing bidnity was received by the outline of the d doorway, if it were crowned by a gable or finial, similar to the main portals of churches. Examples of these are very sc-
241 arce for the earlier time; on the contrary in the late gothic such enrichment frequently occurs, preferably in the form of a recurved or keel arch, richly beset with crockets and cross flower. We give as one of the most beautiful German examples the main entrance of the so-called University, the ancient C Collegium Majus at Erfurt. (Figa 284 [218]).

233. Doorways in Brickwork.

233. Doorways in Brickwork.

North German brick architecture in the beginning of the Gothic period freely accepted the aid of the gloomy severity of granite for secular doorways, when it would produce a stronger impression. Fig. 285 shows the entrance to the main Castle of Marienberg, the jamb and inner part of the arch being 242 constructed of large and very carefully wrought granite ashlars. A trefoil arched enclosing band of brickwork, whose ground is covered by stucco, and some edge courses surround the arch and give to the whole a light ornamentation without disturbing the impression of severe restraint. The great high niche, recalling the "high gates"of ancient oriental palaces, increases the impression of the but moderately large doorway to overpowering magnitude.

In the later time, brick architecture also preferred a richer form of portal. Figs. 286 and 287 [219] give the upper portion of the western entrance doorway of the Neustadt City Hall at Brandenburg. Likewise here by the placing of a segmental arch beneath the pointed arch is formed a tympanum, which is filled by tracery of terra cotta, the openings permitting the ground covered with stucco to appear. Similarly treated 243 spandrels extend the outline of the upper portion of the portal to an enclosed rectangle, and a rich coloring on light a and gleaming colors make even more prominent the grace of the rich ornamental parts in contrast to the dark color of the s stucco ground.

219. From Adler, F. Backsteinbauwerke des Preussischen Staates. Berlin. 1861-1898.

234. Doorways with horizontal Lintels.

Besides the arched doorways of small width are found those with straight lintels, often treated in the simplest way, as shown by the views in Figs. 165 to 167. An enclosure by a s simple angle moulding is frequently added, and is occasionally enriched by capitals on the jamb.(Fig. 288 [220]).

Note 220. From Viollet-le-Duc. Vol. 8. p. 465.

A special and much employed form is then produced, when the free length of the straight lintel is reduced by corbels. T The beautiful late Romanesque portal of the so-called Parsonage in Gelnhausen (Fig. 289 [221]) exhibits, now this motive of

bold members of the jamb are carried around the corbel. In later times it is more usual to insert the corbel in the angle of the rectangle as an independent member. (Fig. 290 [222]). Very favorite and common for rectangular doorways is further a more ornamental handling of the lintel of the doorway, whe-
244 ther there be added a blind ornamental arch in the form of an arched doorway (Fig. 291 [222]), or it be decorated by arms, t tracery, or other ornament within a rectangular enclosure. (Fig. 292 [223]).

Note 221. From the Author's drawing.

Note 222. From Schmitz, W. Der mittelalterliche Profanbau in Lothringen. Pl. 42. Düsseldorf. N.D.

Note 223. From the same. Pl. 63.

Very rich forms were then produced in the later time of the 15 th century by increasing the enclosing mouldings and by t the formation of developed intersections, as well as by other ornaments on the lintel of the doorway. To the simpler forms of this kind still belongs Fig. 293 from a house on Cracow, where the arrangement of very bold corbels is combined with the form idea of intersections of mouldings; by the stepped corbellings the members are brought to a very effective upper termination. Moreover, these upper endings gave the stonecut-
245 ters opportunity to enrich the intersections of the mouldings in the highest degree by a peculiar course of the lines, and thus to permit their art to appear brilliant in a very striking manner. We give in Fig. 294 such a lintel from the Castle at Cracow, one of the richest of its kind, on which the t transition from this mode of decoration to a kind of geometrical surface ornament plainly appears. Fig. 295 gives a lintel from the City Hall at Cracow, on which to the nearly as
246 rich intersections of the middle portion is added the use of arms as ornament.

A fourth Cracow example of a doorway, which is still found in the Collegium Jagellonicum (Fig. 296), again exhibits the same mouldings and like intersections; as an added decoration is a low arch in the form of a depressed keel arch with two finials, treated in the greatest delicacy with the quite fabulously developed and skilful chisel of that time.

b. Windows.

b. Windows.

235. Form of Window depended on the Need of Light and Mode of Closing.

The arrangement of the doorway, aside from the ornamentation, is determined in form and size by its purpose. In the w width and height of the opening for single doors on the one hand and for driveways on the other, scarcely any changes have occurred since the earliest times, and only the artistic treatment changed according to the taste of the time and the measure of the means at command. It is otherwise with the design of the windows. They form no part of the primitive d dwelling, as we have seen at the beginning of our description, but are rather an innovation introduced from the South, and
247 as today in the country so many peasant's houses have a kitchen without windows, which receive not a dim, but an abundant light through the opening in the ceiling for removing the smoke,[224] thus such an arrangement of the principal room in the middle ages may be assumed as very common. In opposition to very ancient custom, the window was pierced only in the course of time. Accordingly it was gradually developed from very
248 simple beginnings to the important and richly treated source of light, as we find it at the close of the middle ages. Of great influence therein was the need for admission of light, which strongly increased according to time and opportunity. In general, the farther back we go into the beginning of the development, it was smaller than today, corresponding to the smaller importance, that reading, writing and other finer occupations then possessed. Yet strong differences are to be noted, in so far that for the state halls of princely courts and similar rooms evidently a greater abundance of light was required than for living rooms, where in regard to the winter cold penetrating through the window, greater light was willi-
249 250 ngly omitted. Then the development of the window stood in i intimate connection with that of its closure; it is therefore necessary in describing the forms of windows, to pay attention to the mode of closing them.

Note 224. See Das Bauernhaus im Deutschen Reich und in seinen Grenzgebieten. Published by the Society of German Architects and Engineers. Leipzig. 1906. -- The arrangement of

the kitchen shown from the Province of Brandenberg (Pls. 4, 5) east of the Oder is also not rare farther west, for example in the north settlement quite near Berlin.

236. Palace Windows without any Closure.

Entirely open and without means of closing, the light openings in palaces of the earlier time were arranged in the form of rich galleries of columns, a beautiful form, where men are doubtful, whether to designate them as windows or arcades. We have before mentioned the reasons why men then suffered t the defective projection from the weather, and give here some examples in detail, on which may be established the lack of all arrangements for closing them.

Fig. 297 [226] gives a window opening from the Romanesque Palace of Castle Münzenberg. Strongly diminished small octagonal columns with widely projecting impost stones bear the plain window arches. The entire group is enclosed within a richly moulded rectangular recess on each side of the wall. The strongly projecting caps of the columns employed here and also on the upper row of windows on the Palace of the Wartburg (Fig. 298 [225]) were improved in the 11 th and 12 th centuries from the tasteless beginnings of the Early Christian period in the treatment of richer windows; particularly in the perspective view do they have a very picturesque effect by the contrast between the slender supports and the heavy arches, between which they form the transition. Figs. 46 and 105 exhibit their strong perspective effect; Figs. 24 and 25 likewise show how this effect is even enhanced by the addition of fanciful and symbolical figures of animals.

Note 225. From the source mentioned in Note 55, p. 71.

Note 226. From Moller. Denkmäler der deutschen Baukunst. Pl. 3. Darmstadt. 1851.

237. Grouped Windows.

The problem of supporting the arched openings of heavy enclosing walls on slender columns, was also solved in another manner. In Fig. 299 [225] is represented the lower window from the Palace of the Wartburg, divided in four parts. The middle point of support is there strengthened by doubling the column, and with the aid of a light corbel block it bears two enclosing arches of the entire thickness of the wall, in which

the arches of the separate window openings are inserted merely as light subdivisions. But the richest is the arrangement of such windows, if their columns stand behind each other in a double row, as in the ruins of the Palace at Gelnhausen, corresponding to the thickness of the wall. In this solution is the most animated contrast formed between the finely subdivided window opening to the heavy masonry of the wall, explainned by the refined adjustment of all proportions to express t the quiet and noblest symmetry.

238. Window Closure by Wooden Shutters.

But not for all rooms were men satisfied with such openings, at most to be closed by curtains; men rather strove for better protection from weather in all living rooms, even if the artistically pleasing form of the grouped window divided by free columns. The means for this was first offered by wooden shutters, that shut against a smooth rebate of the masonry behind the columns, and for wide windows consisted of several leaves connected by hinged iron bands.[227]

Note 227. Further information on the arrangement of such old window closures may be found collected in Ostendorf, F. Ueber den Verschluss des Profanenfensters im Mittelalter. Z Zeitr. der Bauverw. 1901. P. 177 et seq.

That they formely existed is frequently only proved now by the hinge pins only remaining in the wall, on which then hung, or even only by the holes in which these were once set, as at the window at Münzenberg, given in Fig. 302 [226]. But more c commonly the shutters did not shut flat against the wall but in a rebate of rectangular form, which then encloses the window like a recess, as may be seen in plan on the Münzenberg windows in Figs. 301, 303 [226].

It is characteristic of the architectural inclinations of the middle ages, that these lower windows at Münzenberg indeed exhibit an amount of light exactly corresponding to that of the upper windows, but are developed with a substantially heavier impression by the greater width of the jamb and the greater diameter of the middle column. Very characteristic for the 12 th century are also the wide moulded enclosures of these windows, whose members are animated by chessboard patterns and by zigzag decorations, and are elsewhere ornamented

by graceful foliage and scroll work, as for example on the H
House at Metz described in Art. 102.

In order to not be delayed in opening the shutters, it was
usual either to make the internal window lintel curved and h
255 higher than the external one, or to give it a straight horiz-
ontal form. In Fig. 302 such a horizontal lintel is arranged
in the simplest way by the insertion of a wooden timber. Sim-
ilarly on the City Hall at Dortmund, the internal window rec-
ess is covered with wood.

239. Windows at S. Antonin and Münzenberg.

Figs 304 and 305 [228] give an example with arched inner cov-
ering, only peculiar in that under the influence of the anti-
que remains then indeed abundant in southern France, a strai-
ght lintel appeared on the exterior instead of the arched cov-
ering of the window, and then is not at all antique in the r
rectangular enclosure of the entire window group. The long
row of slender columns is there interrupted by stronger piers
at regular distances, which are externally decorated by Byzan-
tine conventionalized forms, and produce a substantial enrichm-
ment of the impression, but internally with strong projectio-
ns and intermediate segmental arches bear the load of the up-
per wall, as well as afford a convenient support for the shut-
ters. This endeavor for convenient closure occasionally leads
to replacing the free columns by rectangular piers, as on the
windows of the later early Gothic palace in Castle Münzenberg,
placed beside the earlier building.

Note 228. From Viollet-le-Duc. Vol. 6. p. 93.

As shown by Figs. 306 and 307 [229] they each consist of three
small pointed openings, externally enclosed by a larger tref-
oil arch, internally by a deep niche with segmental arch. A
256 All external angles are bordered by rounds; on the inside on-
ly, the two middle piers are slightly splayed.

Note 229. From Moller.

240. Windows of Romanesque Living Rooms.

Simpler than the great assembly halls are also the smaller
living and useful rooms of the Romanesque epoch in the arran-
gement of their windows. In Fig. 303 [230] is reproduced a win-
dow of Castle Ortenberg in Alsace, which indeed owes its small
dimensions to a care for defense, but by the addition of a s

seat niche affording space for several persons, it shows that the room lighted by it must have served as a living room. A All shutters are lacking.

Note 230. From Näher, J. Die Burgen in Elsass-Lothringen. Heft 1. Strasburg. 1886.

We give in Fig 309 a window of the Niederburg at Rüdesheim erected for very distinguished occupants, likewise of even g greater simplicity. These windows are inserted in a niche in the masonry, of which the entire building is constructed, and are made of plainly cut stone with sills, side and middle mullions, as well as a high lintel slab, in which are cut the a arched caps. Directly behind the stone enclosure of the windows are inserted stone blocks at each side in the interior at about the middle of the height. One of these has a square recess extending somewhat above the middle, the other a perforated opening, which corresponds to a slot lying in the wall behind it. Thus a thick wooden shutter could be inserted in the niche against the window, then being fastened by a wooden bar, which remained in the slot in the wall, was then drawn out and inserted in the opposite short recess, thus being fastened, just as the case for the leaves of the door, which was represented in Figs. 152 and 153 of the preceding Heft.(1 st edition). This arrangement has only remained unchanged on a few windows of the Niederburg. It appears that formerly on some windows, two such bars were provided. But on others the openings in the inserted stone blocks are less deep on both sides, so that a bar cannot be slid into the wall; it was rather pivoted at its middle at the centre of the shutter, so that one end passed upward and the other downward into the openings, if the shutter was to be fastened.

241. Glazing of the Windows.

Although these windows belonged to buildings in which means were not spared, all without detriment to their architectural beauty, from our standpoint of comfort, have something unusually imperfect, in that with closed shutters, not only cold, storm and rain, but also light was shut out. Small openings for light could indeed be cut in the shutters. Even if no e example of this is preserved to us, then from the similar openings in old doors may we indeed form an idea of the lighting

so produced. Much light was not secured in this way. We must conclude from this, that actually the need of light in those times was only quite small, and with this entirely agrees, w what we learn about the closing of such openings for light f from documents and old descriptions. Accordingly the use of glass, even if its manufacture was again begun after the 10 th century in the monasteries, very long remained a privilege of the churches, and indeed at first only the richer and more important. The difficult conditions of transportation in those times make this entirely apparent. And if the German court poets of the 12 th century usually mention glazing, then is this is to be seen rather a poetic transfer of foreign and southern customs, than a description of actual native conditions. Only with the 13 th century was glazing gradually introduced into the castles of wealthy owners, cities and villages. Until then the openings for light, of whatever kind and dimensions, were closed in secular architecture as a rule, n not with glass, but with sheets of horn, bladder, paper, parchment, transparent linen fabrics etc. And these substitute materials remained in use till the 14 th and even the 15 th century, not alone for the poor, but even in public buildings, as we may show by the city accounts of Berne, Basle, Hildesheim etc., there from very different regions. 231

Note 231. See Heyne, M. Das deutsche Wohnungswesen. p. 235 et seq. Leipzig. 1899.

279 242. Openings for Light above the Shutters.

But meanwhile the advancing civilization in time required the arrangement of larger light surfaces in the window shutters of dwellings, and we have to follow the changes, which resulted therefrom for the forms of windows. Retaining the window shutter, which was recommended by its defensive use, a separate admission for light could be effected above the s shutters. This was attained in a very simple way, when for an arched top of the window, its upper portion was cut off by an iron bar beneath. Then could this upper portion have a f fixed glazing, after the manner of church windows; the lower part was closed by rectangular wooden shutters, movabel. Such windows are found on the beautiful early Gothic Palace of Wildenburg in the Odenwald, still in the form of rich columnar

arcades, [232] in which the decorated side is turned to the interior and the shutters close outside. This arrangement was then retained in certain regions until in the Renaissance period, also after the introduction of the light shutter composed of bars, in spite of the imperfect closure obtained by t the shutter of narrow iron bars. But it was more usual and monumental to make these light openings independent windows of any form over the rectangular ones closed by shutters. S Such arrangements are found in the dormitories of many monasteries, like Arnsburg in the Wetterau, S. Gereon in Cologne, and in Altenberg; but its general introduction was hindered, because it assumed a very considerable height of the room, s such as seldom existed in mediaeval dwellings. But very much more convenient and handy was this form of window, if the separate parts were brought close together, so that the supporting portion of the wall was reduced to a narrow stone mullion. To the earliest examples of this kind belong the very carefully treated window groups, which introduce an almost too abundant light into the rooms lying next the garden in the Overstolz House in Cologne.

Note 232. See Ostendorf.

243. Windows in the Overstolz House at Cologne.

We give in Fig. 310 [233] such a window, or rather a group of four such windows, which above a low parapet for widths of 2.5 ft. have a height of nearly 9.8 ft.

Note 233. From Boisseree.

To subdivide this height an intermediate lintel is placed 5.7 ft. above the sill, which rests on the small columns, just like the lintel in Fig. 305. The upper part is then arranged for glazing, as evident from the groove for glass in the section; on the contrary, the lower part shows externally on the court side a rebate, in which wooden shutters were inserted. Even if these were closed, as was indeed permanently t the case in winter, the upper openings brought light into the apartment. But we can also conceive the shutters to have consisted of frames and panels; some of these might again be open and also could be closed by separate shutters and at the same time by glazed frames, so that according to desire and need, one might either on one side shut the glazed light into

the shutter or on the other the small solid shutter, an arran-
gement such as we find common in the 15 th and 16 th centuri-
260 es on the lower Rhine, as well as in Flanders and the other
Netherlandish parts of the old German empire. -- Somewhat lar-
ger yet is the arrangement in the other room of the same House
next the court, that shows three windows of about 6.6 ft. cl-
ear width by 10.6 ft. in height, that are only separated from
each other by two piers 2.3 ft. wide (Figs. 311, 312 [233]).
Here a simple lintel could not be inserted; for the vertical
support also of the main and intermediate lintels must be set
an intermediate mullion. Externally this window is entirely
without ornament; only the rebates exist, in which the shutt-
ers closed, one for each double opening. The interior is the
show side. The piers are there moulded, and the moulding is
also carried around the lintel. In the recess thus formed a
are rounds like little columns, fixed to the mullions of the
stone cross by headers, and set in the angles of the piers.
In order to arrange a header on the lintel above for the rou-
nd, that stands beside the mullion of the stone cross, both
rounds on the lintel are mitered obliquely and their ends are
set perpendicular to those of the pier headers. On the para-
pet are arranged those seats, which make the window recesses
so convenient.

Note 233. From Boisseree.

This last example already shows how the system of arcade o
openings divided by small free columns passes into the form
of windows furnished with cross-shaped stone mullions, whose
development from the simple undivided window of the living
rooms will now be considered.

244. Window with Framed Leaves.

A substantial perfecting of the admission of light was att-
ained, when men made the movable closure of the window a fra-
mework instead of a board shutter, constructing it of small
261 strips and filling it with leaded glazing or translucent mat-
erials. The form of window was influenced by the fact, that
these narrow frames not more than 3/4 to 1 1/5 in. thick cou-
ld only be made of limited dimensions, about 2 ft. wide and
at most 5.0 to 6.6 ft. high, further being of rectangular sh-
ape. Thus at first it was unnecessary to arrange upper wind-

windows; the windows of the living rooms then took the proper form of a rectangular opening in the wall, furnished with
262 rebates inside or outside to receive the sashes, and for a further architectural treatment being surrounded by a moulding of any preferred kind on the side without a rebate. By a series of such adjacent windows, which were then separated by stone mullions, by the addition of ornaments on the moulding enclosing the opening, and in the late Gothic time by rich intersections of these mouldings at the angles, very respectable effects could be produced. These were preferably heightened from the beginning of the development by giving considerable height to the window lintel and decorating it by sunken blind tracery. Examples of a simpler kind have been reproduced in the illustrations of the preceding Chapter. The graceful form in Fig. 313 [234] shows to what magnificence such an originally simple form might be developed.

Note 234. From Schmitz, W. Der mittelalterliche Profanbau in Lothringen. Pl. 56. Düsseldorf. N. D.

245. Rectangular Window with Transom; Window with Transom Bar.

Both an increased admission of light was provided by still wider openings, as well as a more imposing architectural effect was further obtained, if above the rectangular opening of the light sash of limited size, yet other openings were added, separated by a narrow stone transom bar. These were also rectangular in the simplest case, the form surrounded by a moul-
263 ding or rebate, and this by the combination of two axes in each group, it formed the cross window, indeed the most general form of window in the developed middle ages. We see it in the previously given illustrations of the Grand Master's residence in the Marienburg (Fig. 101), on the Guild House Gürzenich and on the Etzweiler House in Cologne (Figs. 167, 230), on the citizens' houses from Steyr (Figs. 193, 195), in a triple arrangement on the University at Cracow etc. With the simplicity of form and execution, we may therefore forego the presentation of other examples. It should be only noted, that for high rooms several such transoms separated by such transom bars were placed above each other.

The stone cross windows, in the place of which appeared win-

windows merely divided by mullions, where the height gave no opportunity for an intermediate transom, continued through t the middle ages, and were still in use in the 17 th century in Cologne, for example, indeed without mouldings and only h having a rebate externally, in which might be set the shutter, as just for the first ones in the 13 th century.

In France are found the stone crosses in the House of the Monastery of Cluny, for example (Fig. 116). On this building we see at the height of the transom bar a belt extending between the windows and carried around the upper part of the window by returned angles. Its origin had the motive, that the transom bars did not have the height of the usual ashlar courses, so their ends must either be inserted in another ashlar, or that on its account a similar low course must extend through the masonry.(Called a "rat course" in Nuremberg). This low course was then furnished with a cap moulding and was allowed to extend above the window as a hood.

Note 235. From Viollet-le-Duc. Vol. 5. p. 406.

246. Rectangular Windows with Tracery in the upper Opening.

The transom of such a cross window, like all further occurring rectangular openings, was regularly glazed in Germany: on the contrary in France, it was likewise fitted with movable leaves, according to Viollet-le-Duc's illustrations. In regard to the decoration of the lintel etc., it could be treated in all cases just like the previously mentioned undivided rectangular window. But for a richer effect instead frequently appeared a perforation of the tracery forms carved on the lintel in a complete round or even an ornamental window, separated from the lower window by a narrow transom, and which must naturally be permanently glazed. Fig. 314 gives a simple Gothic example of the first kind from Verdun [235].

We see a stronger solution of the second kind in the later illustration of the graceful gallery of Castle Vayda Hunyad. (Fig. 331). Such forms then further became the starting point for solutions of the richest kind, which compete with the tracery windows of church art in magnitude and richness of t the forms. They only differ from those in nature, that a strong lintel separates the lower part of the window from the

upper regularly developed tracery, for the purpose of adding movable window leaves, whether sashes or shutters. Deep recesses in the walls frequently occur, in which at the sides w were mostly arranged rather high stone seats, in order to make the entire arrangement more habitable and comfortable. In s strikingly beautiful and grand, also very severe development, we find such a window design on the Hall structure of Landgrave Hermann at Marburg. We give in Fig. 315 [236] the internal elevation, the section and plan of this window, and call attention, how the different thicknesses of the permanently glazed portions, and the externally closing shutters, produce an originality in appearance. We have there assumed board shutters for the lower openings, without denying the possibility, that these parts may also formerly have had glazed sashes.

Note 236. From the author's drawing.

247. Sliding Windows.

Some peculiarities of mediaeval forms of windows are yet to be mentioned in conclusion. In many provinces, as in the Tyrol and also occasionally in lower Saxony (Goslar, Duderstadt), Westphacia (Lippstadt) etc., sliding windows often occur instead of hinged sashes, where the movable sash may be slid into a recess in the masonry or sidewise before a fixed portion of the window. They afford the advantage of dispensing with the expensive iron fixtures, but however have not been generally introduced. Fig. 417 gives an example of such a closure from Castle Freundsberg with shutters; yet in their places w were also found sashes with glass.

The windows of the domain of brick architecture were arranged to receive glazed leaves, where fixed glazing was not employed for assembly halls etc., a rectangular wooden framework of wooden mullions and transom bars being constructed in the arched opening, so that the masonry of the usually segmental tymp.num rested on its upper rail. This wooden framework is about 4 ins. wide and 5 ins. deep, and is plainly treated as a rule; yet occasionally are also found richly moulded examples with lavishly carved forms of bases and capitals.

248. Stairway Windows.

A truly mediaeval conception appears in that not rarely the
266 windows of stairways, in the closest connection with the form

of the interior, are furnished with obliquely inclined lintels, and frequently with parallel sills. We give in Fig. 316 [327] a window of this kind from a house in the Brunnenstrasse at Metz.

Note 327. From Schmitz.

249. Windows with Dropped Arches.

As a very peculiar treatment of form with piquant charm is then to be named the use of the "dropped arch", composed of a circular arch curved downwards. It found its richest treatment in upper and lower Saxony with broad and frequently intersecting mouldings and graceful base forms. The animated m movement of the lintel in the definite examples, as on the city Hall at Neustadt-on-Orla and on the State Building of t the Castle at Meissen (see Plate next p. 10), even adheres to the division of the lintel, so that instead of being straight and horizontal, it rises in curved lines.

250. Stone Dormer Windows.

An entirely original invention of northern mediaeval art is also the use of dormer windows with stone gabled enclosure, that finds its support on the front wall of the house. It f forms one of the boldest means of subdividing the mass, and plays an important part in the development of the roof lines. Our view of Hotel Cluny (Fig. 110) shows them so arranged, t that before them extends a tracery balustrade as a termination of the house proper. Considerably stiffer is the effect, if the entire dormer window is set in the same plane with the lower masonry, either not separated from this or only by the continuous main cornice. Our plate next page 110 exhibits t the form of these dormers of the Albrechtsburg in Meissen, w where they are placed quite near each other and play a great part. Likewise on the City Halls at Hanover and at Salzwedel [238], and particularly in the secular architecture of the brickwork provinces, as well as in the stucco architecture of B Bavaria, they commonly appear. Especially rich are they developed on the French castles of the late epoch. Fig. 317 [329] reproduces a very richly decorated dormer window of this kind, that is found on the Castle at Josselyn (Brittany). There occurs the peculiar arrangement, that the windows of the upper story with doubled stone cross and finial, extend upwards far

above the cornice, so that only the low upper window with a stone cross and gable can be regarded as a dormer window. The side enclosure of the dormer window is represented by small turrets with high finials rising from a gable between four s small blind dormer windows. To the gable of the dormer window correspond these finials as buttresses; but the simple treatment of the gable of the dwelling usual in France, to which attention will be called elsewhere, also appears here, and only a monogram is here added as a decoration of the triangular surface. The entire dormer window is extended so high, that its ridge intersects that of the main roof.

Note 238. See Stiehl, O. Das deutsche Rathaus des mittelalters. p. 72, 79. Leipzig. 1905.

Note 239. From Viollet-le-Duc. Vol. 6. p. 190.

251. Cellar Windows.

Of smaller architectural importance for the general appearance of buildings are naturally the cellar windows; but since they are placed near the eye, they are usually treated with great care in the details. The thoughtful method of working in the middle ages, which was so lovingly absorbed in the peculiarities of every problem, developed a peculiar form in t the endeavor to permit the light to fall as far as possible into the interior of the cellar. For this purpose the lintel of the window is often strongly inclined inward, for example on the City Hall at Villingen. On the City Hall at Cracow, the master inclined the grating as far as the lower edge of this inclined surface, then further treateng the whole with a rich cove with entire consistency. (Fig. 316 [240]).

Note 240. From Essenwein, A. Das mittelalterlichen Kunstdenkmale der Stadt Krokou. Leipzig. 1866.

252. Bay Windows.

If we examine the window recesses formed in thick walls and common in the earlier buildings, for example the dormer windows of the Albrechtsburg at Meissen, which with their great depth certainly form a small separate room, we appreciate the comfort for which one of these could be arranged. Also in s spite of the smallness of the room, the view through the window is especially attractive; likewise is also charming the effect of lighting obtained in the room, if the light from t

the deep recess enters the interior. We may therefore properly understand, that in the 15 th century and especially in i its second half, men allowed some windows to project externally from the walls on corbels, thus artificially forming a deep recess, that substantially increased comfort in the interior of the room as well as the picturesque appearance of the building externally. Fig. 319 [241] gives an example from the City Hall at Perchtoldsdorf near Vienna. In very varied ways are formed the corbellings of these windows. They are mostly like consoles, stones of different sections projecting beyond each other, which are then connected by anchors, or a slab is laid on them, which at the same time forms the internal floor. Figs. 320 to 322 [240] afford various examples of such projecting stones, which were also employed to support galleries and other projecting portions of the building. They are from Cracow and found a new place in the restoration of the Collegium Jagellonicum there.

Note 241. From drawings of Essenwein published in Mitth. der K. K. Cent. Comm. zur Eforsch. u. Erhalt. der Kunst- u. Hist. Denkmale. Vol. 6. p. 190. Vienna. 1861.

253. Bay Window in the Court of the City Hall at Nuremberg.

Very commonly are such slightly projecting portions of the building also placed on a series of gradually projecting mouldings, as may be seen in pretty simple form on the projecting window, that Hans Behaim in the year 1515 built in the City Hall of Nuremberg, in the passage before the council room. ((Fig. 323 [242]).

Note 242. From a drawing, which the faithful coworker of Essenwein in the last rebuilding of the City Hall at Nuremberg, architect Walroff from Gensbach, associated with him by the magistracy, prepared in the Building Bureau, and which he later also used with some changes in the work;-- Mummenhof, E. Das Rathaus zu Nuremberg (Nuremberg, 1891).

The enclosing wall of this passage next the court rests on an arch, and therefore the corbelling of the window must be so bonded in this arch, that an entire series of stones, on one side being five besides the closing joint, on the other two, thus seven large stones in all of the arch project from

it. In these is cut the profile of the corbelling and beside the latter is cut the section of the arch. Blind tracery covers the surface of the little structure. A decoration like a column and composed of twisted members animate the middle; the roof is a simple stone roof with slightly concave inclined surfaces; by its bonding into the upper masonry, it opposes the tendency of that corbelled mass to fall outwards. The entire small structure has the manifest purpose to enlarge t the space for those, who had to wait before the council room. Therefore it finely completes the charming view presented by the small court of the City Hall to those, who pass through it lengthwise, as well as to those ascending the stairway to the council hall beside the small bay window.

254. Larger Bay Windows.

Generally these corbelled windows do not project very greatly from the face of the wall, as our examples show. But if the walls do not afford in their thickness sufficient space to provide the desired depth of the internal window recess by a small projection, then men did not avoid even greater projections, by which were then also produced a more animated subdivision of the external walls. Thus also occurred on the exterior rectangular bay windows of substantial importance. T Their support is likewise frequently formed by projecting mouldings, as on the charming bay window of the City Hall at Amberg.[243] Also vaulted projecting courses of stones, whose visible surfaces are preferably decorated by rich ribs commonly form their support, as for example on the Castle at Büdingen, the City Hall at Alsfeld, etc.; but most favored was its support by an arch, turned between strong piers or consoles at the sides. One of the most famous and important examples is given in Fig. 324[244]. It is the so-called "Golden Dachl" in Innsbruck, which duke Friedrich "with empty pockets" built, and had adorned by rich painting and gilding, apparently to contradict the nickname given to him. The bay window rests on a low segmental arch, and above another projection bears a graceful open story.

Note 243. See Stiehl, p. 150 and Fig. 171.

Note 244. From Dollinger, C. Architektonische Reise-Skizzen. Heft 1, Pl. 5. Stuttgart. 1873-1881.

Opportunity for an entirely luxuriant development and the display of the most refined art of the stonecutter is then given by the corbelling of a bay window on a house in Freiberg-i-B. (Fig. 325 [241]). We likewise see on this, how with a sufficient projection of the bay window might be afforded through side windows a view along the main facade.

255. Triangular Bay Windows.

The charm of such a view became so important, that men also then frequently sought to create heavy and massive bay windows projecting from the face of the wall, even when this was not desirable on artistic grounds. Fig. 326 [246] from the Castle of Schlegleritter at Heimsheim, gives the internal effect of a small bay window, that only required to have the small triangular middle portion project from the wall, in order to produce the desired outlook.

Note 245. From Dollinger, Heft 8, Plo. 5.

Note 246. From Paulus, E. Die Kunst- und Altertums- Denkmale im Königreich Württemberg. Neckorkreis. Stuttgort. 1889.

256. Little Apses of House Chapels.

Special importance is usually obtained by the projecting "little apses" of the house chapels. The importance of the arrangement of a separate chapel in the mediaeval house and the forms assumed by it, we have to treat further in describ-
272 ing interiors; we only concern ourselves here with its external portion, projecting like a bay window, and which as a rule is intended to receive an altar. Indeed not rarely are these modestly arranged, and like the plain rectangular chapel bay of Castle Jufahl in the Vintschgau, are not to be distinguished from the favorite bay windows of living rooms. But if permitted by means at command, men liked to project them as half octagonal in the style of church choirs, and they then permitted the location of the house chapel to be clearly recognized from the exterior.

273 As for the earlier of these small apses, they are so simple, that we have to add but a few words to even the small illustrations represented in Figs. 37 and 70 of the preceding Helf of this Handbook (1 st edition). They are semicircular with a stone roof, that of Landsberg having a round-arched frieze, several wall strips, as well as some variously treated windows,

and built on a moulded support like a corbel. The little apse of Trifels has a richly decorated cornice with arched frieze, a single window, and its support consists of two corbels connected by an arch and closed by a half vault extending to the interior of the tower. The little apse of the Chapel of Kamparhof in Cologne rests on a moulded semicircular substructure and has three painted windows; the roof was covered with slates. Still plainer is that of the Domkirche at Naumburg, built on a conical corbelling. Also quite simple examples a are preserved from the Gothic period; such as that of the City Hall at Nuremberg (Fig. 226) and that on the University at Cracow.(Plate opposite p. 206).

257. Little Apse from City Hall at Prague.

But in the cousse of the 14 th century, the architecture of these little apses was developed into true ornamental pieces. Thus the little apse of the house chapel in the City Hall at Prague, represented on the adjacent Plate, was executed with a richness previously unknown.

The lower story of the entire building has a considerable projection, that extends for the width of the apse, so that its projection only requires less importance, since a rectangular pier forms a special support. The transition to the o octagon is so arranged above the capital of this pier, that vertical surfaces extend upward from the angles of the pier, in front being placed an upper narrow and slightly projecting trapezoid between two triangles, while half trapezoids of a similar kind occupy the sides. On the octagon thus formed, four wide corbels project, between them extending upward an inclined surface, so that a complete support is given for the cornice, from which is suspended a perforated arched tracery frieze. At the angles of the widely projecting cornice are formed heads as corbels, on which stand columns. Their capitals should bear figures at the height of the parapet, above which are placed attached rich canopies. Behind these is then developed an architecture of finials as far as the main c cornice, connected with strong gables above the slender pointed windous. A tracery frieze in the form of a graceful arcade terminates the entire chapel and also the body of the apse at top, whiln receives the character of a spire by a lofty

pointed roof.

258. Little Apse from the Carolinum at Prague.

Nearly allied thereto is the little apse on the Carolinum at Prague (Fig. 328 [247]), but which with less height is developed somewhat more in breadth. It is particularly the peculiar form of the substructure, which first attracts the eye. An octagonal pier supports it; a simple and large cavetto characterizes the projecting mass; but at each angle as at the middle of each surface, a rib rises from a corbel, forming a very animated outline by its freely projecting tracery.

Note 247. From a drawing in the Wiener Bauhütte.

259. Little Apse on the Parsonage of S. Sebald at Nuremberg.

Considerably smaller and especially lower is the beautiful little apse on S. Sebald's Parsonage at Nuremberg, which is even more richly treated than the two at Prague. We give it in Fig. 329 at the same scale as those in Prague.

Even the substructure is here ornamented by finials and gables, and it has five supports for figures. Richly subdivided anf furnished with hollows animated by foliage, the projection rises above this pier. The little apse itself has finials at its angles; the parapet bears representations from Biblical history in high relief, and above them are arranged a series of canopies below the parapet capt. Roch and triply divided tracery windows fill the principal surfaces, again w with figures above them in the spandrels. A cornice with cavetto, in which is found a band of roses, terminates the structure, that now bears a low roof, out of proportion, which in our drawing is raised to the usual ratio.

260. Other Little Apses in Nuremberg.

Likewise in regard to the beautiful little apse on Schlüsselfelder's Tower in Nuremberg, we must recall with a reference to Fig. 127, since there instead of the usual pointed roof is built a lantern for a constant light, an even steeper proportion being produced thereby, than elsewhere by the spires.

Even a third little apse of some importance was possessed by Nuremberg in the old Lorenz Parsonage court, which was again rebuilt in a copy on the new Parsonage court, using some of the old stones. It is simpler than the preceding and is

represented in Fig. 330, but it likewise has a corresponding pointed roof; on account of the upper story, the copy must unfortunately be satisfied with quite a low roof. There should also be mentioned the otherwise very simple double small apses found in the former Augustine Monastery, now transferred with its remains to the Germanic Museum, and there rebuilt. The lower small apse belongs to the chapter hall mentioned in Art. 296 (Fig. 396), the upper one to the dormitory and is designated as the Chapel of S. Augustine.

261. Little Apse on the Abbot's House at Maulbronn.

In conclusion we mention, with reference to the statements in Chapter 10 (House Chapels), at least in a small perspective drawing, the little apse in the Abbot's dwelling at Maulbronn [248], on account of the high substructure, necessary because the chapel was in the third story. Since it is not orientated, we should not designate this little apse as such, but as a bay window, were it not directly attached to the hall of the Abbot, which is not conceivable without a house chapel.

Note 248. Paulus, E. Die Cistercienser Abtei Maulbronn. Stuttgart. 1873 - 1879.

262. Bay Window at Vayda-Hunyad.

Meanwhile we have many bay windows, that are almost similar to the little apses. Since we cannot give many examples, we present in Fig. 331 [247] one of the most beautiful and richest examples of a bay window allied to the little apses, four of which are visible on the western side of the hall building of Castle Vayda-Hunyad (Fig. 68). These four bay windows stand in the middle of the defensive gallery and rise from the buttresses, that support the hall structure; like little apses, they have finials at the angles, between which and over a horizontal cornice, gables animate the upper parts of the surfaces, while entirely separated from them are stone cross windows therein. In order to take into account the warlike significance, at least in some degree, they are not glazed, but are furnished with strong wooden shutters, which are not opposed to peaceful use, if they were constructed as described in Art. 240.

263. Bay Window Towers.

277
278
263. Bay Window Towers.

In the entire domain of architecture various motives pass into each other by intermediate steps, and thus the bay window is combined with other motives. Thus for example, the picturesque effect of small stairway towers frequently led to t this, that similar small towers, not containing stairways, a are arranged at the angles of buildings or in reentrant angles of courts, whereby a room in each story receives an extension, which contributes much to the effect of the interior. The small towers are polygonal in plan and rise at the angles and on the surfaces of buildings, are sometimes limited to a single story, then having externally almost the appearance of little apses; but they are however only bay windows. As a r-rule, they are simpler than the real little apses; particularly the windows mostly exhibit the simple stone cross construction and have neither pointed arches nor tracery like church windows. Such a small tower of polygonal plan thus consists of a series of windows over each other. Therefore it could rise from the ground to beyond the roof like a small stairway tower, or it might even commence on corbelling in an upper s story. We have illustrated in Fig. 332 such a tower from Innsbruck. Likewise a series of flat projecting windows were placed on the facades of houses as small towers.

264. Derivation of the word "Erker".(Bay Window).

All these designs are generally designated as "Erkers", however varied in form; in Nuremberg they are all exceptionally termed "Chorlein". (Little apse). The latter appellation is so far justified, since the oldest Erkers were actually C Chorleins of house chapels. It is extremely probable, that t the name of "Erker" is derived from these.[249] For the mediaeval plural of arcus (arch) was "Arcora", which was also used for the apses of churches. The oldest German form of Arker, as well as the word Chorlein, leads us back to the corbelled apses of house and castle chapels as the origins of these charming portions of the building. Only a further transfer of the meaning occurs, in that in many provinces the luthern windows of the roof were termed Erkers or roof-Erkers.

Note 249. Heyne, M. Das deutsche Wohnungswesen. p. 349. Leipzig. 1899.

c. Galleries and Open Porticos.

265. Origin of Open Porticos.

From the south, with its fear of the scorching rays of the sun and for the dampness of rain, doubtless came the custom into modern secular art of arranging arched passages along t the city houses. We must indeed derive their origin from the 279 East; they then became naturalized first in Italy and southern France. Through the Tyrolese and Swiss cities, which as regulated and rich markets and resting places for the travel of the world at that time were particularly adapted for the transfer of southern customs, these also penetrated into the German cities, and were formerly more widely extended than today. Already in the South is it indeed rare, that they extend through the entire city; even more in the North are they restricted to certain principal streets for passage and traffic in the city, or to the perimeter of the market place. Thus at one of the most beautiful examples at Mûnster in Westphalia, they occupy only the long street of the "chief market", or in east German cities like Heilsberg, and in Bohemian cities like Budweis, they only extend around the rectangular marketplace or the ring. Men have conjectured, that in their introduction in the North the influence of the connecting passage was effective, which in imitation of antique porticos connected together the separate parts of the great Carlovingian Palace. But it is indeed simple to conceive a direct transfer of the form, as it was only later developed in the South, in which as a difference from those more detached connecting passages, the lower gallery is entirely recessed into the house, and t the upper living rooms are built over it. Whether this form was first developed in city streets or in the courts of princely palaces (see Avignon, Trient etc.), might be difficult to decide. It might very well be possible, that just the custom of having such open porticos in the courts of princes led to arranging them likewise in the cities. Indeed there they not merely afforded the comfort of a shady retreat from the heat of the sun; but they also widened the narrow streets, without taking from the houses more than the space in the ground story. They provided sale booths for these, and when we hear of "cloth galleries" etc., we can conceive that even the

sale tables were placed in the porticos, just as may still be seen in the trade galleries in Strasburg, Berne, Bözen and o other cities. They further created for the house owner the possibility of making the ground story useful for sale rooms, that might even be without any connection with the interior of the house. Where these porticos were arranged, there were only exceptionally wanting open vaults behind them and next the street, but these mostly stood beside each other in rows corresponding to the arches of the galleries, and where a house had no entrance from another side, such was often left between them and was entirely separated from the vaults.

266. Dimensions and Construction of the Porticos.

The width of such porticos and their height vary within wide limits. Among those of the Tyrolese cities are found those, which are very narrow and mostly of unequal width, so that t the average width of 9.8 to 13.1 ft. is diminished in some p places to 4.9 ft. or even less. But also they indeed in many places extend beyond this average size to 16.4 or 19.7 ft. We find some, whose height does not amount to 8.2 ft., while others have heights of 9.8 to 13.1 ft. and even more. They partly have beam ceilings and partly vaults of the most varied kinds, according to the mode of construction of the houses to which they belong.

On this also depends the form of the front of the portico. Almost without exception the porticos open toward the street with arcades, in the earlier time with round arches, from the 13 th centwry onward with pointed arches, which rest on round,
280 square or rectangular piers, partly chamfered or otherwise s subdivided. In general predominate the simplest rectangular piers, which often assume very stumpy proportions for bearing the heavy load of the facade; but also richer forms of piers of varied shapes occur, an example of which is given from the marketplace at Vercelli (Fig. 333 [250]), built of brick. If men had good cut stone at command, then columnar forms were also preferably employed, at least for the intermediate supports. We give in Fig. 334 [251] a beautiful and widely opened example from Metz, and refer to the representation of the City Hall at Münster in Fig. 217, where finely designed round piers of stumpy proportions bear the massive pointed arches

of the portico.

Note 250. From Stiehl, O. Der Backsteinbau romanischer Z Zeit. Pl. 17. Leipzig. 1898.

Note 251. From Schmitz. Pl. 27.

As an example of the southern form, we further give a small Gothic house from Serravalle, a beautiful little city North of Venice (Fig. 335 [252]), notable for the lightness of the s supports made of granite, by the well preserved rafter cornice of the edge of the roof, and the still plainly visible remains of the ancient painting.

Note 252. From my own photograph.

267. Porticos in several Stories.

The motive of the portico was considerably enhanced, when it was opened in several stories above each other. This fine opening was also not general on the exteriors of the houses; Venice possesses in the Fondaco dei Turchi a very early example, but that is then thrown far into the shade by the well known two story magnificent portico of the Doge's Palace. We give on the adjacent Plate a splendidly executed example from German soil, from Bruck-on-Mur, taken from the so-called Kornmesserhaus, apparently belonging to the former ducal court.

The ground story has a height of 14.8 ft. including the thickness of the vault. The distance of the columns between c centres amounts to 12.1 ft., the height of the shaft of the column is 5.2 ft., or 9.0 ft. with base and capital; the octagonal bases are simple, but the capitals are composed of a
281 series of rich intersecting mouldings, changing in form on e
282 each column, which are attached to the nucleus. A rich subdi-
283 ivision, whose top forms a recessed gable, encloses like a k keel arch the segmental arch. Above the columns, finials stand on consoles, that intersect the mouldings, but the cornice at top is now wanting, just as the cross flowers of the o ogee arches no longer exist.

In the second story two upper arches correspond to each lower arch, resting on octagonal piers of red marble. The entire subdivision is thereby essentially smaller. The upper recurved arches intersect, but do not end in a cross flower, b but in a stone like a console, on which stood an animal or a human figure. Blind tracery ornamentation on the lower span-

spandrels of the arches and extremely piquant perforated tracery balustrades of varied design complete the rich impression of the front side. To it corresponds the extremely animated treatment of the upper segmental vault (Fig. 336 [152]), which with its rib-work curved in plan, frequently intersecting and decorated by cusps and foliage bosses, presents one of the m most artistic examples of its kind.

268. Porticos as Passages around Courts.

A particular importance was acquired by porticos as accompanying court plans. Even in the one story form, they differ thoroughly from the cloisters of the monasteries, for their arches are entirely free for:passage, being without tracery or columns in them. But they here very frequently take the form with several stories, so rare in external porticos. For they serve on the one hand, as in the streets, as protected standing places in the lower story; but also in the upper stories permit passage between the different parts of the building. Thereby the simple purpose of utility appears more strongly beside the monumental effect, and we frequently find such court galleries in the simplest form, usually even built of wood. Thus the Castle of the Teutonic Order at Gollub in Prussia shows the two story passame, as usual for the seats of the order, executed in a very carefully constructed but e entirely plain wooden construction. Richer and often completed with very charming carvings of the balustrade are the wooden passages in several stories in the courts in Nuremberg. Besides the execution in perishable building materials occur other simplifications; thus on the arched passage of the University at Cracow (Fig. 337), the omission of the separate c covering of the upper passage, which is rather treated as an open passage, and is only somewhat protected from weather by the projection of the roof. The whole thereby acquires much in lightness of appearance; particularly the supporting arches are light and narrow. To this is added, that the vaulting of the passage is constructed in the form of cellular vaults without ribs. Thus by the placing of those graceful upper m members on the short round piers are produced very peculiar solutions, some further examples of which are added in Figs. 338 and 339.

In a very independent manner, such court enclosures are developed in many cities of Austria. There is usually combined the national custom of projecting entire parts of the building on corbels with the arrangement of galleries in several s stories, which gives to the peculiarly narrow courts a highly picturesque as well as a comfortable and habitable effect. In Fig. 340 [253] is represented as a characteristic example t the court of a private house in the city of Steyr.

Note 253. From my own photograph.

Above the ground story project corbels supported by strong projections, and these support two galleries of masonry. Slender porphyry columns, very gracefully treated in varied forms, support their open arches and by means of stone cross o beams, the tunnel vaults of the galleries. In the upper sto-
285 ry is still a remnant of the tracery balustrade formerly existing; for the lower story the masonry balustrade may be regarded as original. Notable is also the boldness of the solution at the angle, which extends free and without a column,a above the vaults abutting against each other.

Much more grandly are arranged the columnar courts of Nuremberg. There should be especially mentioned the great court in the Krafft House in Theresienstrasse, as a striking example, how men liked on German soil to interrupt the uniform quiet of such court galleries by the insertion of stairway towers etc., and how at the same time the stone architecture with arches of wide span in the lower story was united with the wooden architecture of the projecting roof.(Fig. 341 [254]).

Note 254. From Gerlach, M. Alt-nürnbergs Profanarchitektur. Vienna und Leipzig. N. D.

Chapter 6. External Stairways.

269. Original and Simple Forms.

We have seen in the description of the earlier palace buildings, that men at first regarded the connection between the separate stories of the building as an external addition to the independent parts of the important internal rooms, and d did not usually foresee the arrangement of internal stairways.
286 The execution of these ascents may at first be regarded as e extremely simple; yet the appellation of "Stiege", which originally signified a ladder furnished with steps, was generally applied to stairways. As a difference from this simplest kind, men designated the rarer and more luxurious designs at first as "Greden", from the Latin word "gradus", the step. The preference for external stairs prevailed during the entire middle ages. It permitted in the simplest way the internal arrangement of the rooms, particularly in the great hall structures, to be kept entirely independent from the arrangement of the stairs, and with skilful construction also afforded a pleasing animation to the exterior.

270. Open Stairs of Wood and of Stone.

Usually and even later, men were satisfied with plain wooden stairs. Thus on the City Halls in Gelnhausen, Goslar, Dortmund etc.; also luxurious palace structures, like those illustrated by us at Münzenberg and Gelnhausen, can scarcely h have possessed any but wooden external stairs. Naturally, nothing of these has been preserved; even of the stone external stairs at the Palaces of the emperor at Goslar, in Brunswick, and at the Wartburg, there have hardly come to us such remains, that we can again mentally restore the general arrangement. Even with entirely monumental form, they were plain in their details, and were calculated purely for the effect of masses. Only the upper end, as at the side stairway structure of the Palace of the emperor at Goslar, may have been frequently covered and adorned by graceful windows with columns. A somewhat later arrangement is the famous stairway of the C Castle of Montargis, an attempted restoration of which is given by Viollet-le-Duc.[256] In contrast to the stairway elsewhere attached to the facade of the building, it rises with a flight placed at right angles to the facade of the great hall,

down to the court, sending from a landing other short flights to right and left. It was covered by a wooden roof resting on slender stone piers. With such a covering was then preferably busied the progressive architectural development of such stairways, and just here German architecture succeeded in extremely charming and picturesque forms. It is very common f for only the area of the top to be roofed, then being further accented by extending higher a bay window or clock tower, as in Dettelbach-o-M (Fig. 342 [255]), or in the Renaissance period at Mosheim in Alsace. Men proceeded otherwise, as already seen at Montargis, the ascending flight being under a roof, which was then supported by wooden posts and wooden cornice, or in more lavish examples, by stone posts and arches. Perhaps the richest design of this kind is the external stairway of the City Hall at Pössneck in Thuringia, executed in the luxuriant forms of the late Gothic; rising at two sides, covered by cross vaults, and at the top being connected with a corbelled pulpit for announcements.

Note 255. From Grisebach, A. Das deutsche Rathaus der Renaissance. p. 113. Berlin. 1907.

Note 256. Viollet-le-Duc. Vol. 5. p. 290.

We give in Fig. 343 [257] a plainer example, the charming ascent to the Sexton's House of the City Church in Steyr. Four slender stone supports, set on the balustrade of the stairs, bear the arches of the roof and also its tunnel vaults by means of horizontal stone beams. In a similar manner the substructure of the stairs is vaulted underneath, in order to afford convenient access to the lower story.

Note 257. From my own photograph.

288 271. Flights of Steps in Courts and Porticos.

With open stairs by their form may also be reckoned the beautiful designs of steps, which are usually found within courts or even in great covered porticos. In Tyrolese peasants' houses and castles picturesque examples are abundantly preserved to us, frequently connected with corbelled galleries and vaulted porticos, mostly richly supplied with tracery balustrades or gracefully wrought iron railings.[258] Also the City Halls at Freiberg-i-B, Amberg etc., possess beautiful designs of this kind. Certainly, all stairs, that were built in the

north are narrow and steep, measured by our present scale. On the contrary, we find more dignified general propotions, and particularly less steepness in southern countries, adding such a design from the Audiencia at Barcelona in Fig. 344 [259].

Note 258. Some examples from Sterzing and Klausen are found in Steffen, H. Baudenkmäler deutscher Vergangenheit. Heft 5, 6. Berlin. N. D.

Note 259. From Joly, H. Meisterwerke der Baukunst und Kunstgewerbes in Spanien,. Vol. 1, Pl. 63. Wittenberg und Leipzig.

272. Winding Stairs and Stairway Towers.

In the later epoch of the middle ages, winding stairs were preferred to straight open flights, which extended partly in the street and partly in the court outside the wing of the o building, against which only were they placed. Since they m mostly rise high above the edge of the roof and are covered by a pointed roof, they have the form of small towers and substantially contribute to increase the picturesque character of the buildings. We refer to what is later said in Chapter 12 in regard to the stairs as a part of the interiors of buildings, and we extend that here in regard to the external a appearance, so far as with a mode of construction peculiar to winding stairs, the exterior can be considered separately from the interior.

289 These small stairway towers were externally round in the e earlier time, but at least from the beginning of the 14 th c century onward were in part hexagonal or mostly octagonal. The simpler ones exhibit only a number of oblique windows, r rising obliquely above each other. Considerably richer became the effect, if the windows were larger, so that they occupied nearly the entire side of the octagon, leaving only a plain angle pier, and if they were subdivided or had a stone cross. A further development occurred, when the octagonal a angles of the small towers were furnished with small buttresses, which were also arranged externally with inclined caps, tracery, parapets and other ornaments. Also corbels with figures often are added, over which rise rich canopies, or the angle piers are joined by arches, beneath which is arranged the tracery taken from church architecture, above rising the

complete equipment of finials and gables taken from the same source. At the top some 3 gables then have their roofs intersecting the pointed roof of the tower, or above a projecting cornice a tracery balustrade terminates it, or even the richly decorated battlements of a passage, which is arranged at the base of the pointed roof, or as a horizontal stone platform becomes the roof itself. Such small stairway towers do not always rise directly from the ground; they are partly carried upwards from variously arranged corbellings on the second or higher stories.

An example of a richly opened and unglazed winding stone stairway, that may be taken as an open winding stairs, was g given in the representation of the court in the Krafft House. (Fig. 341). But these interiors were mostly glazed; their internal treatment then entirely corresponds to the winding stairs wholly within the interiors of buildings. As the greatest work of this kind may pass the splendid stairway tower of the Albrechtsburg at Meissen, as shown by our plan in Fig. 102, which aside from its great dimensions, acquires special importance by the vaulted passage in five stories extending around it. It was further terminated in the earlier time more pleasingly than by the projecting gables added in the 19 th century, for above a low upper story furnished with small windows having dropped arches and crowned by a light horizontal cornice with gutter, the pointed roof rose in independent and charming lines.

Chapter 7. Roof and Gable.

a. Roofs.

273. Importance of the Roof.

The upper termination of the house, the roof, is well known to have played in mediaeval architecture, at least in the north, an incomparably greater part than in any earlier time. It was not only designed for the need of a protecting covering, but already in the earlier time was utilized by its imposing height to intentionally enhance the effect of the mass of the building. While in the Romanesque period men were satisfied with an inclination of the roof of some 45° or little more, the accenting of this effect of the mass led in the later development to ever steeper slopes of the roof, so that the angle of 60° may be regarded as the rule, yet many solut-
290 ions also strove for even more pointed and steeper inclinatiions. From this considerable importance obtained by the roof, regarded purely as an architectural mass, were now developed a fineness of lines and a wonderful art of subdivision, which formed one of its greatest titles to fame, as an entirely new acquisition of mediaeval art. Thereby the roof became entirely fused in the general effect of the building; particularly for simple structures, it was transformed into one of the most effective and determinative means of expression.

274. Gable and Hip Roofs.

Already the plainest gable roof enclosed between gables forms not merely the combination of two inclined planes. Generally the feet of the rafters were set a certain distance inside from the edge of the roof, so as to prevent tearing out the gains, that hold them. When this recession was filled by a separate light framing or furring, an intermediate form was obtained at the border between the vertical wall and the inclined surface of the roof, which could harmonize both portions of the building by a steeper or lower inclination of the furring as needed, by a more abrupt or more gentle transition. Likewise the arrangement of hip roofs, the next improvement in the form of the roof, is treated in the sense of an animated mode of working suited to the particular case. The middle ages was not acquainted with the modern mechanical carpenter's rule without feeling, according to which the hip roof

by principle receives the same inclination as the corresponding gable roof. It produced an incomparably more charming e effect, when it regularly gave to the hip roof a steeper slope, frequently increased almost to the vertical, that permitted it to adapt the lines of the hips and the length of the ridge of the main roof to the artistic requirements. Not seldom also a hip roof terminated in three sides of an octagon, such as shown by the representation of Schönbornerhof in Geisenheim (Fig. 86). Men especially understood in Germany how to give a strong and quiet appearance to the great surfaces of the roofs, even when broken by frequent dormers for the use of the attic rooms, for in the form treatment of these subordinate forms was exerted the most refined reserve, which is unfortunately often missed in our modern imitations.

275. Roof Additions.

For a richer animation of the masses were made large additions thereto, and especially polygonal bay windows, to accent the angles or even to break the longer sides. As at the example just mentioned or on the Schlüsselfelder House in Nuremberg, these might rest on lower corbellings; but frequently they form merely a true part of the roof, from whose surfaces they project. A good example of these, that by a subdivision of the roof produced by small means, could give to the simplest mass a strikingly animated effect, is presented by the H Hochzeithaus at Marburg, which we illustrate in Fig. 345. S Still more powerfully is the roof surface animated by placing thereon transverse gable roofs, particularly if these rise a above the cornice with a substructure in one or more stories as transverse buildings. The Castle in Meissen, the City Halls at Brunswick, Hanover, Saalfeld, etc., afford excellent information, how by such additions the mass of the building may be effectively enhanced, and at the same time be subdivided in the most striking manner. Finally occur attached stairway towers and bay windows with their pointed spires, here and there even boldly and pleasingly arranged roof turrets, to complete the varied and fresh effect of the roofs. But it must be emphasized, that this very rich world of form is always so skilfully handled, that it is subordinated to the great principal forms of the roof. Not in free caprice, but al-

almost always in severely axial arrangement do these accessories subdivide the great surfaces of the roof, permitting its general forms to always predominate. The great gable roof e everywhere forms the quiet background for the most animated play of transverse structures, bay windows, gables and turrets. To this essentially contributes the fact, that the harmony of these ornamental parts with the roof surfaces, just as already emphasized for the little roof windows, is increased by the great reserve in the detail forms. Great restraint in the projection of cornices, the sparing use of ornamental accessories, with the most delicate graduation in the course of the roof lines characterize these precious solutions. Their thorough study, which certainly concerns itself, not with books, but with the buildings themselves, leads into one of the most enjoyable and most profitable divisions of the world of architectural form; to pursue it is an imperative requirement for new creations of a similar kind.

276. Covering of the Roof; Straw, Tiles, Shingles.

For covering the roofs certainly predominated at the beginning of the development the use of building materials most r readily provided, straw or tiles. Rural buildings everywhere and until the latest times, as well as city buildings of the earlier time, we have to represent to ourselves with thatched roofs. Naturally nothing remains of such ancient roofs.

Both regard for distinguished appearance, as well as the endeavor for greater security from fire permitted other modes of covering for better buildings to become prominent quite e early. To the first condition only corresponded the use of split wooden shingles, which were already characterized by this name (scindula) as an inheritance from antiquity. They perhaps represent the oldest form of roof covering, by which our masonry buildings were covered, and this doubtless frequently continued in use in the later middle ages, as it is still at home in forested regions. It is likewise recommended by being easily obtained and prepared, which can either be d
294 done by the owner himself or by his servants. By careful selection of the wood and careful smoothing, so that moisture quickly flows away, a tight roof may indeed be made with these, which does not fail very quickly. Easily executed ornam-

ornamentation of the lower ends and varied painting, such as still is customary in Alpine lands, must make the effect of such a roof considerably richer. This indeed afforded the opportunity to also transfer the shingling to the vertical surfaces, an example of which may be found in the preceding Heft (1st edition, p. 242, on the representation of the Pfennigturm in Strasburg). Other beautiful examples of such use are also found in central France. Thus the porticos around the court of the Hospital at Beaune [260] have shingled surfaces; likewise the court of a prominent house in the street of S. Trinite at Troyes exhibits such a charming use of this mode of covering, that we reproduce it here (Fig. 346 [261]), although already Renaissance influences are there mixed with the traditions of the middle ages.

Note 260. See Verdier and Cattois. Vol. 1. p. 1 et seq.

Note 261. From my own Photograph.

But the endeavor for greater security from fire also already early commenced to supplant shingles on the houses of important persons in the country, as well from the closely arranged houses of the cities. For German cities we already have from the end of the 13 th century the earliest magisterial ordinances for the use of tile coverings of roofs; this requirement was indeed tolerably obeyed in the course of the 14 th century in the larger ones; in the smaller, the elimination of thatched and shingled roofs continued down to the last century, and it is still not completed in many mountain regions.

277. Slate Roofs.

The use of slate roofs for secular buildings in the middle ages was restricted to those regions in which slates could be easily obtained, or where they could be imported without great difficulties and expense. These must also have found employment in the Rhine provinces already before the middle ages. At least on the Saalburg were found remains of roofing slates, which are regarded as Roman. On the form given to the separate slates in the early middle ages, we have no information; but we must assume indeed, that the usual and still continuing oblique German covering must extend back to a very early time. At least it must have been common generally at the close of the middle ages, and have been similarly treated at i

its borders as today. Even if we now doubt, that any slate roof now existing on any mediaeval building, be still original and unchanged, it must still be assumed, that even with numerous repairs occurring since the middle ages, the old mode of covering and the form of the slates were retained, even if originally they might have been different. But since we find them so long preserved in this manner, we must conclude, that they were also earlier employed likewise.

278. Metal Roofs.

Metal Roofs were formerly more common in church architecture than for secular buildings, where they were only on small accessories, turrets, bay windows etc. Where this mode of c covering also found employment in secular architecture, its treatment was the same and indeed very plain, as likewise on the former. Meanwhile the usual lead coverings of the edges of slate roofs also gave opportunity for placing ornamental crockets of lead on the hips, for richly decorated ridges, a and to furnish the angles and spires with ornaments. Certainly in most parts of Germany no great use was made of these d decorative forms, since men preferred the unbroken lines; most of this decoration has also disappeared. Yet especially along the Rhine have remained certain portions, but which are hard to find, since the buildings are mostly restored, and t thus the old and strongly weathered lead has been assigned to a new place, or is so concealed, that it cannot be found from below.

More than in Germany has such lead ornamentation been preserved in France, and it appears in the middle ages to have b been more commonly produced, and in richer forms for use. We therefore select a French example from many, and give in Fig. 347 one such, which is found on the Hospital in Beaune, and the representation of which is taken from Viollet-le-Duc (Vol. 5. p. 283). The three details placed beside it are those of the cross flower and of two foils beneath it. But in far the most cases, were also employed for metal roofs much plainer forms, simple foils placed on a wooden stem sheathed in metal, with light iron bars to support the wind vanes.

279. Tile Roofs; Concave Tiles.

Chiefly remains of tile roofs of the middle ages have been

preserved to us. We indeed have no more, which have not been repeatedly restored later and even recovered; but many yet r-remain, on which most of the separate tiles still date from the middle ages, with so many different tiles in museums and collections, both ordinary and ornamental tiles, that we could write quite a long chapter on the tile coverings of the middle ages, if we did not have to merely notice everything. Preferably are two methods of covering, with which we have met, and which proceeded beside each other from the beginning of the middle ages to beyond their close.

294 One is allied to the antique roof covering, where flat tiles with upturned edges found employment, and which were so f fixed beside each other, that a concave tile was placed over the adjacent edges of each pair of tiles. Yet already at the close of the antique civilization, instead of the underlying flat tile, men also used concave tiles, so that the covering tiles lie pretty close to each other. Today and long since, men used for this method of covering the technical name of "nuns and monks"; but whether these appellations were already used in the middle ages is doubtful. The dimensions in which the separate tiles are made, are quite varied and in part are indeed considerable; just the oldest appear to be the largest. In the collection of the Germanic National Museum at Nuremberg are found fragments, which are 24 3/8 ins. long and 10 5/8 ins. wide, weth a weight of 23.8 lbs. If one conceives these covered with somewhat narrower ones set properly in mortar, there are about 20.5 lbs. per sq. ft. This was indeed a considerable load, and it required a stronger framework of the roof, which was rare on the smaller houses, to support such a load. Medium and small concave tiles indeed produced a relatively lighter roof; but it still must have been too heavy for the ordinary framework; for in Nuremberg and likewise in Quedlinburg aud elsewhere is not seldom found the case, that also with the use of smaller and thinner concave tiles, the upper covering rows or "monks" were entirely omitted, and by good mortar alone in the joints of the "nuns" was produced a tight roof. For this it is to be noted, that the "nuns" were hung on strong laths by the knobs on each tile, but on the c
295 contrary the "monks" were mostly without hooks and were laid

on the former, since otherwise the roof would have looked too rough, if knobs had projected from each visible tile. The k knobs were easily broken off, even if tiles so burned were n not at command. For fastening the "monks" only one means existed, that of punching a hole in them with a pointed tool, fastening them with an iron nail to the lath, and which could pass between two "nuns". All the different stages are visible in Figs. 348, 349.

280. Flat Tiles.

This first generally extended method of covering was from early times contrasted with a second, that with flat tiles, also here and there named "pocket", beaver-tail" etc., whose origin is to be sought in the wooden shingles, in whose place they appeared. In the course of time and in different regioons, they received different forms, according to which, as f for shingles, they formed different designs on the roof. Very ancient are the tiles represented in Fig. 350 from the country around Lake Constance, a considerable number of which are found in the Rosengarten Museum at Constance, and that m may date from the 12 th to the 13 th centuries. They diminish from the top toward the point, are relatively thick, and their upper surfaces are slightly convex. Placed beside each other, they leave open a triangular space between them. Since then the next course does not completely cover this, but only the third course c, a bunch of straw was inserted, so t that air and wind could not enter the opening between b and c and pass through the open triangle above a into the interior of the attic. Flat tiles of a very peculiar kind, certainly belonging to the 12 th century, have recently been found also during the restoration of the Cathedral at Wetzlar.[263] They have the form of a rectangle with an added triangular point, and thus far surpass those just described in tightness of the covering, they are also very carefully made and have a light glazing on the points.

Note 263. See Stiehl, E. Zur Froge mittelalterlicher Dochdeckung. Denkmalpflege. 1906. p. 77.

In Nuremberg during the middle ages two forms were in use for such flat tiles, of which it would be hard to determine the older; the spade tiles (Fig. 351) or the pointed (diamond)

tiles (Fig. 352). If we take the former to be earlier, it h has this reason for it, that they are somewhat more convex t than the pointed tiles, which were partly made entirely flat. the covering of spade tiles forms a very attractive pattern, but if the convexity of the separate tiles be so great as for those esteemed oldest and attributed to the 14 th century, a are not airtight like those of Constance. If each tile at a rests on the highest places of the row of tiles beneath it, then the point b falls over the lowest place, and thus the a air and particularly the cold may penetrate under b into the attic room. That bunches of straw were employed in Nuremberg is not known. Since indeed the tiles are never mathematically plane, but even the best are a little warped, then indeed the tile covering is never completely airtight. It is well known, that at the lower edge, as well as on the ridge of the roof and at the gable ends, fragments of tiles are necessary, which the tiler now produces by cutting whole tiles. In the middle ages these portions were formed and burned separately. Thus to construct a roof with pointed tiles, plain tiles a a and half tiles b at their beginning and end; thereon as many common tiles c as the roof required. At the ridge were necessary two shorter rows d and e, which were not hung on laths, but on the uppermost row of ordinary tiles c. As may be seen from the section in Fig. 353, a row of hollow tiles is set t thereon with mortar to form the ridge. It also appears from this section, that such a roof always extends 4 3/4 to 6 ins. above the surfaces of the rafters, since at every place, aside from the lower edge, the tiles lie in three thicknesses. Thus it is always a quite heavy roof, that is produced by this mode of covering. The rain water falling on the individual tiles flows downward to the edge. Yet a large part of it runs along to the point, and only there falls on the tile lying beneath. Therefore at the dege of the roof, if the ordinary half tiles were used, a great part of the water was led to the gable, and thereby this became wet. Hence frequently special tiles f were burned, whose points lay at a distance from the edge and conducted to the surface of the tile beneath it. But the same end was generally more simply attained by raising the roof surface next the gable by wood strips

laid beneath. For the hips and valleys, tiles could be made in stock, since they must vary for each different inclination of the roof, and normal profiles of roofs did not exist.

281. Manufacture of Roof Tiles.

What particularly characterized the earlier mediaeval tiles is the carefulness of the work. The clay was evidently most carefully purified; for it is entirely free from every injurious ingredient and also from coarse gravel, extremely uniform and finely worked. The tiles are naturally struck in moulds, the knobs being very carefully modeled by hand and firmly attached while the tile was in the mould, so that by firm pressure the knob was joined to the tile, without altering its form. They must not be too wet, but be pressed in the mould with considerable force and be slowly dried. When they were about half dried, the upper surface was wetted again, and made as smooth as possible by means of a brush or the hand. To this treatment is it due, that all pores of the surface were filled and consequently no alges nor moss were formed, no dirt settling on the tiles, which the next rain would not wash off. The tiles retained their deep red color until today, a and one can distinguish each mediaeval tile of a roof from t the later tiles added in restorations, since all later tiles even if they retained the old form, were less carefully made and have therefore become black.

The two native forms of roof tiles in Nuremberg are not restricted to Nuremberg; they also occur elsewhere in entirely similar kinds. But also those with semicircular, segmental and square ends are found. Fig. 354 is a representation of the roof covering produced by a tile, as well as the tile itself, like several found in the Monastery of Heilbronn, yet which appear less carefully made, than as just stated.

282. Colored Glazing.

Already from these examples is apparent how varied was the ornamentation, which the roof might receive from the shape of the tiles alone. But color was then added. Men covered the portions of the tiles remaining visible on the roof with colored glazing, thus in Austria, Tyrol, Switzerland, Swabia and
299 Alsace, particularly with green, reddish brown, yellow and w white, and so could form colored bands, lozenge and zigzag

patterns on the roof, as well as similar simple rug patterns.
Such a frequently splendid decoration of the roof always ext-
ended over the entire roof surface, so that its unity of eff-
ect remained undisturbed. In taking up again this mode of o
ornamentation, this has not always been considered, very much
to its injury.

283. Decoration of Ridges and Hips.

Since generally in the middle ages, men attached great imp-
ortance to the appearance of the roof, they occasionally sou-
ght to give more life to the outlines of tile roofs by ornam-
ents. The ridge line already received animation thereby, th-
at the knob sides of the hollow tiles were inserted within e
each other, as well as their diminished ends. But men also
loved decorated ridge and hip tiles produced by special forms.
We give in Fig. 355 the representation of a ridge, which c
came from one of the former foundation buildings of the Mins-
ter at Basle, where also the hips are decorated by strongly
projecting crockets, while Viollet-le-Duc found this on S.
300 Fides at Schlettstadt; these ridge and hip tiles are glazed
green. The hip tiles represented in Figs. 356 and 357 are f
from Schwäbisch-Gmünd, and that represented in Fig. 358 came
from Villingen to the Germanic National Museum. Meanwhile
peculiar animals and men in comic positions are also employed
as forms of such hip tiles.

284. Caps and Cross Flowers.

Likewise the apexes of the hip roofs and the points where
the ridge tiles unite with the hip tiles rising in two lines,
often received a special covering and prominent accenting.
In describing metal roofs, reference was made to wind vanes,
which were made of lead or copper and turned around a vertic-
al iron rod, which was often richly ornamented at its lower
part. These likewise frequently found employment at such pl-
aces on tile roofs. These terminations were mostly arranged
in such wise, that a weak and diminished wooden pole had a r
round or polygonal cap, and the whole was covered by sheet m
metal, copper or lead. Ornamentation was then rarely and sp-
aringly used, rather in the form of a little crown instead of
the simple cap; the carefully graduated outline was mostly l
left to have its own effect, or there was also set on the cap

an iron rod as the support of a wind vane. A characteristic example from Kayserbberg in Alsace is given in Fig. 359. For
301 tile roofs, such terminals were made of burned clay, and then were regularly glazed in varied colors. From Prussian churches came the examples in Figs. 360 to 363, all remarkable in that their basal forms were made on the potter's wheel, then
302 brought into the final form by easy hand work. Even the rich, with the effect of a graceful cross flower, middle portion of crown of S. Catherine in Danzig was produced from a basal form like a bowl by skilfully cutting away certain parts and a adding knob-like projections, which reproduce the curves of the cross flower by means of pottery. Considerably more expensive were French crosses of this kind, made by the aid of the sculptor. We give in Fig. 364 a terminal from the Bishop's Museum at Troyes.[265] It is glazed in different colors and a apparently belongs to the 13 th century. The upper part is perforated, so that one might take it to be a chimney cap. It is naturally composed of several pieces. From the 15 th century dates a terminal likewise composed of several parts, which Viollet-le-Duc published as found in Villeneuve-l'Archeveque.(Fig. 365 [265]).

Note 364. From my own drawing.

Note 365. From Viollet-le-Duc. Vol. 5. p. 274, 277.

303 285. Chimney Caps.

Similarly to these small accessories, the chimney caps finally contribute to the appearance of the roof. Certainly very few complete examples have remained till our time, at least in Germany. Many of those contained in the corresponding publications can pass only for free restorations. But the c charming chimney cap, that crowns the chimney flue of the Prühmessenhaus in the Monastery of Maulbronn (Fig. 366 [264]) in the form of a graceful turret with a stone finial, shows however with what love men began to develop these architectural parts already in the beginning of the 13 th century. Similar and still more richly treated examples were published from Puy-en-Velay and S. Lo by Viollet-le-Duc.[265] On the Rhine and the Moselle, when chimneys rose from the external wall or the gable of the building, men liked to carry down a projecting band, and at a certain height to stop this on a corbel of some

kind. See the representation of the Foundation of S. Gereon at Cologne, given in Art. 223 (Fig. 262). If the chimney caps were very tall in general, then were attached to them additions on two sides like buttresses for strengthening them, as shown in Fig. 367 [264], from the Castle of the Elector of Mentz at Oberlahnstein. The upper termination then mostly remains without ornament and is composed of a simple cover slab or s steep slope. In other regions subdivided caps were placed on the chimney caps. Famous for this are the varied fanciful s solutions on polygonal and circular plans, which besides other Italian cities, Venice in particular still presents above its roofs in accordance with ancient traditions. They serve at the same time to keep off rain and disturbing winds, as w well as for decoration of the house, and Tyrolese art has apparently often influenced them. We give in Figs. 368 to 371 [267] a selection of forms collected there, and finally in Figs. 372 [268] and 373 [269] some caps from Oestrich and Kaysersberg, by which an extraordinarily rich effect was attained with relatively
304 simple means, plain tiles and stucco. With considerably greater expense, men in France and England also subdivided the shafts of chimney caps in brick or cut stone by vertically a ascending mouldings, for which the chimney caps in Fig. 253 may serve as examples. Particularly on English castles of t the 15 th century, these attained an importance not reached elsewhere.

Note 266. Viollet-le-Duc. Vol. 3. p. 211, 212.

Note 267. From Möhring, B. Ein vernochlässigter Freund. Deutsch. Bauz. 1895. p. 448.

Note 268. From Luthmer, M. Bau- und Kunstdenkmäler des Rheingaues. Frankfort-a-M. 1902. p. 232.

Note 269. From my own drawing.

b. Gables.

256. Gables in the View of a City.

As terminations of the great roof surfaces serve the tall gables in a monumental way, and in them is most strikingly expressed the high importance, which the roof possesses for mediaeval architecture. In the picturesque appearance of isolated buildings, the gable plays a most highly important part. Yet more imposing is its form on the city dwelling; for

in the countries, where generally the gable end of the house is turned toward the street, gables mostly adjoin, and they alone determine both the expression of the single house as well as the general view of the city. In the duration of such impressive rows of gables adjoining each other, time has certainly torn wanton gaps nearly everywhere. Only in a few cities may one still enjoy, as for example on the principal marketplace in Münster, how these gables combine in a united effect, each accenting its individuality, but freely arranging itself in the whole.

287. Gables in Half Timber Work.

Least naturally remains to us of the gables of the earliest time, and this is especially true of the gables of wooden construction, whose history for us begins only with the 14 th c century. The little house in Marburg, which we have represented in Fig. 139, is the oldest of its kind known to us, and exhibits such a plain gable, that we can assume entire simplicity for its predecessors. Of woodwork only so much is contained on it, as required for its construction; it substantially contributes to the clarity of effect, that the arrangement of the roof framework with its framed walls and plates was likewise carried out on the exterior. Like the other stories of the house, the gable projects beyond the story beneath; yet it rises without further projection in itself; The edge of the roof projects only very little beyond the gable; a projecting pair of rafters no longer exist; only the framework is not cut off quite flush with the gable, thus projecting slightly; outside is also nailed a verge board.

The same arrangement of the margin of the roof is also mostly found on the later German buildings; but on many structures the different stories of the gable also project with their plates beyond each other like the other stories, thereby producing a great abundance of forms, as well as by this a r rich development of the streets and of window parapets. The upper part then indeed also has a cap or hipped surface, i.e., it is cut off, inclined and covered like the roof itself. As an indication of such a cap we may regard it, if for example as on the Butchers' Guild House at Hildesheim, the upper part of the gable is indeed vertical in height, but is lathed like

the roof and the vertical surface is covered with tiles or s slates. Otherwise the upper portion of the gable occasionally differs from the fower, from the portion framed with vertical posts and horizontal girts, when it is filled by a uniform surface with timbers crossing each other in lozenge form.

288. Projecting Gables.

If a projecting pair of rafters terminate the gable at too, then is required a framework of the roof with purlins projecting beyond the gable, on which the rafters might rest, so t that a pair of rafters also finds place before the gable, and the roof could project so far, that the gable received an effective protection from the effects of weather. The French house in Fig. 142 exhibits a similar form, where indeed only the plates of the uppermost story project and the gable remains in its plane. Then an arched construction is arranged before the house and under the projecting pair of rafters, that indeed conceals the function of the different timbers. For actually only the rafters are set against the plate, and the horizontal beam lying above the crown of the arch, in spite of its different cuttings, is a plate, and by its various tenonings or halvings with the pair of rafters, produces above a fixed triangle. The lower fastening of the extended angle of this fixed triangle, by the addition of the strut and of the impost of the arch projecting in the air, has become no better on the plate, than if the rafters were tenoned directly into the plate; meanwhile the arrangement holds, and thus we have little right to require more. Similar projecting gables are also found in the Netherlands, in Aix-la-Chapelle a and on the Moselle, perhaps as shoots of French architectural influences.

289. Gables in Masonry Construction; Earlier plain Forms.

Far more varied is the form of the gable in masonry construction. It is natural to adopt the obvious, and to allow it to follow exactly the outline of the roof. There under simple conditions, a special termination upwards is not necessary; the covering of the roof can simply be extended over the masonry of the gable, as shown by the beautiful Romanesque gable of the Conversationshaus of the Monastery of Eberbach.(Fig. 374 270). It is a plastered structure of split stone with c

cut stone portions, plain indeed, but very carefully executed. Likewise the upper ending of the gable is quite skilfully treated by a band of cut stone; the omission of a gable cornice is less to be referred to a lack of means, since the main cornice of the building extends beneath the gable in the same f form as on the sides of the building. In the tasteless transition to the roof is rather expressed a particular mental t tendency, that on many buildings remained in force until the close of the middle ages. The orderliness of the Renaissance period first required absolutely the enclosure of the tympanum by a cornice. In the greatest number of cases, this certainly existed also on Romanesque and Gothic gables. On many buildings it forms the only art form employed on them; thus
306 in the Romanesque time on the Frühmesserhaus and the Herrenrefektorium in Maulbronn. On others, as on the Refectory of t the Monastery of Heilsbronn, on the Castle at Budingen, etc., occur arched friezes, corbel ornaments, German bands or the like. More rarely is found the arrangement of rich ornamental windows in most small Romanesque inclined gables of secular architecture. Few more lavish subdivisions of the surfaces yet appear; rather is preserved the simplicity of the effect of the surfaces. But little is changed in the French Gothic in this respect. The cornices received the generally c common form of the inclined wash, and the previously straight slab of the upper termination was made in the form of a slope inclined on both sides, as shown by Fig. 171. The edges of the gable were beset with crockets, and crowning by a crossflower may have occasionally occurred. But in the treatment of the surface of the gable, men were very backward; the French secular gable remained plain with very rare exceptions, even above a richer architecture below it.

Note 270. From Schäfer, C. Die Abtei Eberbach im Mittelalter. Berlin. 1901.

290. Richer Subdivision of the Gable.

In Germany this condition rather forms an exception; on t the contrary with us, men preferred to express the importance and richness of the building just in the ascending gable. T Thus many gables are more imposing in height and dimensions than the lower part of the building, and not seldom an other-

otherwise entirely plain structure is enhanced by the luxuriant treatment of its gable to become a show piece of architecture. Frequently indeed then the gable area was regarded in the old way as a simple surface without direction, ornamental windows or sculptured ornaments of all kinds were freely inserted, or on the late Gothic period, it was uniformly covered by tracery in animated lines; yet another sort of development predominated. In harmony with the ascending outlines of the gable, were especially vertical divisions, that animated the surface of the gable in the form of blind arcades, tracery, or even as piers with greater projection.

Such a subdivision was then developed by the addition of tracery, shields of arms and other relief ornaments into great richness, but preferably so enhanced by adding a more powerful central motive. As such served a buttress extending a about to the apex of the gable, which was accented by a canopy and figure decorations, as on the abbot's house in Heilsbronn; but most of all by gable turrets, which in the most decided and richest development emphasized in the most effective manner the sharply aspiring vertical lines. The gable of the City Hall in Weissenburg on the Sand (Fig. 375 [271]) may be taken as an example of this. At the same time it shows h how the force of the "upward tendency" is continued even above the ascending lines of the gable in the almost abruptly as-
309 piring slender finial for the most effective animation of an otherwise entirely plain outline.

Note 271. From my own photograph.

Another means occasionally employed for heightening the effect of the gable was its combination with slender finial turrets, which rose from its ridge. Fig. 376, taken from the C Court of Justice in Ghent, presents a beautiful example of t this kind; more plainly, but with greater force is employed the same form idea on the Heilliggeist Hospital in Lübeck.

291. Stepped Gables.

An entirely different basis appears for the treatment of t the surfaces of the gables, when they are not bordered by inclined lines corresponding to those of the roof, but rise in rectangular steps. These stepped gables may have arisen in regions with quarried stone, from the endeavor to avoid the

gable slopes, which are only durably constructed of plain cut stone; the dignified accenting of the masses resulting from its form, the daring strength expressed in it, there made it a particular favorite in north Germany. On the earliest examples the steps were mostly large and wide; in the late time and especially in south Germany, men reduced them to the pleasing dimensions of less than 20 inches. At first and in the Romanesque period indeed, the surface of the gable was carelessly filled by real and blind windows (see the two houses f from Cologne in Figs. 111 and 165); frequently even horizontal caps occur as borders of the individual steps, as on the houses in Stadthagen represented in Fig. 205, and on the brick gable of a house at Luneberg in Fig. 377. As a contrast to this strong accenting of horizontals, special small terminations were usually added to the wide steps; stone pyramids with free tops, as in Stadthagen, battlements or also finials, or each step terminated upward with an easily ornamented smaller blind gable. All these accessories served to animate the outline, as well as to enhance the great difference between the cross section of the roof and the gable, and this effect was even strengthened, if open tracery was inserted between these aspiring terminations, and generally being capped by t the form of a half ogee arch, being thereby combined with the mass of the gable. The citizen's House from Lemgo in Fig. 378 [272] exhibits this very expressive solution in combination with an otherwise very plain gable.

Note 272. From my own photograph.

With these rich means for animating the margin of the gable was then combined on the richest examples the subdivision of the surfaces by aspiring blind work, when the projecting finials were carried down to the base of the gable. Thereby the splendid effect of the surface was intimately combined with the ornamental caps of the steps, and the highest plane of t the impressive treatment of the gable was attained, as embodied in the City Hall in Münster. (See Fig. 217 as one of the finest examples).

292. Gables in Brickwork.

A very prominent part was further played by the great gables in brickwork, and they experience in this a quite peculiar

development. Fig. 377 already gives the impression of earnest strength, which is so well produced in this material. On other great examples this tendency was accented by the development of the vertical wall strips into bold octagonal piers, but on the other by the rich alternation of color, produced by the use of glazing and of plastered surfaces, as well as by the abundant ornamentation by graceful open tracery, rosettes, screen gables, an extremely pleasing and festal impression was produced. Fig. 379 [273] shows on a monastic building in Zinna, how far with relatively simple meanr was often carried the lightness of subdivision and the contrast with the lower surface of the wall; the gable end of the City Hall at Königsberg in the Newmark (Fig. 380 [274]) may represent the s splendid effect of the richer examples.

Note 273. From Adler, F. Mittelalterliche Backsteinbauwerke des Preussischen Staates. Vol. 2. Pl. 61. Berlin. 1862-95.

Note 274. From the same. Pl. 111.

An unusual wealth of artistic gradations lies in these solutions between the graceful play of light forms and the weighty earnestness of arrangements of massive piers, as most characteristically represented on the citizen's Houses in Greifswald and wismar, valuable materials for thorough studies. We must unfortunately here restrict ourselves to the brief indications already given.

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312 II. Development of the Interior.

Chapter 8. Wooden Ceilings and their Supports.

293. Beam Ceilings of the larger Halls.

As monumental domestic architecture commenced with the erection of festal halls, these likewise in the entire middle ages form the basis for the richer internal treatment. The development of the latter may be continuously followed, and what was worked out therein then surpasses the at first extremely simply treated actual living rooms.

Naturally there have remained to us from the earliest hall structures only descriptions filled withe enthusiastic prais-
313 es, which with difficulty are estimated at their absolute practical value. We shall have to judge of these high assertions by the contrast with such simple conditions in other respects, but may assume for them in any case, that the buildings were chiefly finished by painting, and that they had wooden ceilings. It is stated that wooden ceilings also were for a very long time afterwards the most common mode of construction for most secular hall buildings. They already occur in the plainest construction, the squared beams remaining visible without any covering beneath, their surfaces hewn with the axe, only by the warm color tones and the peculiar surfaces of the structural material producing a clear and dignified, as well as a comfortable impression. Very commonly were they employed in this manner, so interesting by its modesty, in castles and city halls, when a layer of planks or timbers extended a-
314 bove the simple beams, so that the entire depth of the beams remained visible beneath. 275 The internal view of the Knights' Hall in Castle Schlegler at Heimsheim (Fig. 338) reproduces such a ceiling. For higher pretension, the joints of the ceiling planks were covered by battens, but particularly the angles of beams were changed by chamfers, coves or richer mouldings. The connection with the masonry was preferably so arranged, that a beam was placed as a wall bean on stone corbels next the wall, into which the beams were then gained. These wall beams were then usually ornamented by mouldings, and as a rule and without structural purpose, they also extended along the end walls before the beams. Figs. 381 to 383 show such an arrangement from the Castle at Cracow with the

peculiarity, that the intervals between the very closely spaced beams are not closed by transverse planks, but by longitudinal half timbers rebated in, and that between the beam ends are framed small blocks, which recall the mouldings of the beams. A further substantial enrichment is found on another ceiling of the same building, (Figs. 384 to 386), produced by richly moulded small cross beams instead of the joint battens previously mentioned, so that a division into coffers with t with the strongest effect is produced. These coffers are then closed by board framed panels as in cabinet-makers' work. The members of this ceiling have the considerable depth of f fully 3.28 ft., in which they do not stand alone at all. The great dimensions of the wooden timbers here employed are based on the width of the hall, here amounting to about 26.3 ft. The fanciful effect of this massive treatment is yet enhanced by two strong girders, that without any clear necessity lie beneath the narrow lower beams and near the walls. The first assumption of a later addition becomes doubtful, because elsewhere, for example in the abbot's house at Lehnin, is repeated a similar arrangement, appearing to us illogical and evidently serving purposes of beauty.

Note 275. Such examples of mediaeval forms of ceilings are found in Schäfer, C. Die Holzarchitekter Deutschlands. Berlin. 1889 et seq.

294. Girders.

The form of the girders, which are here added more as free accessories of an artistic caprice, everywhere wins great importance for the appearance of beam ceilings, where on account of the width of the room to be spanned, or the weakness of timbers at command, support of the ceiling beams becomes necessary. Since they strongly affect the eye, they were specially treated, richly moulded or even decorated by carvings. We give in Fig. 387 [276] and on the adjacent Plate such a ceiling from a house in Eppan, where for a width of room of somewhat more than 19.7 ft., a strong girder is employed to bear the shallow beams. It is ornamented by rich coves and a carved bottom member in the form of a turned moulding, on the s sides being very effective sunken ornamental work. At the s support, it is strengthened by a wooden bracket cap beneath,

likewise richly treated.

Note 276. From drawings in the Wiener Bauhütte.

295. Ceiling Supports of Wood and of Stone.

If the width of the room were increased so much, that even girders alone could not bear the weight of the ceiling, these were then supported by wooden or stone isolated supports or posts. They for very long plans of halls very commonly resulted the arrangement of girders and rows of posts as preferable, and which extended lengthwise the hall, according to the width of the room being one in the middle, two or three, or indeed in four repetitions, as in the Kaufhaus at Constance. As a very characteristic example serves the Knights' Hall of Castle Schlegler at Heimsheim in Würtemberg (Fig. 388 [277]), whose ceiling is supported by three rows of heavy oaken supports. These isolated supports are of the simplest form there, and as usual have such dimensions, that the girders are strongly enclosed by their fork-shaped upper ends. A tenon left in the middle of this mortise then extends into the girder a and ensures its immobility lengthwise. The posts here in part directly support the girders, partly by steep braces or a also by bracket caps, which likewise extend through the upper part of the posts. Elsewhere these posts are indeed treated with great liking, and the number of beautiful solutions is extremely great. Thus Fig. 389 [278] reproduces a typical method of treatment from a connection in the ceiling of the Granary at Ulm, which with merely the expedients of the carpenter attains to a very clear and effective treatment of base, shaft and cap. The ceiling resting on this isolated support, b besides the structurally necessary girders also has others e extending in the same direction as the beams, only with regard to beauty. The advantage in extending beams on all four sides and afforded by this arrangement, has been ensured in other cases by placing similar braces as under the girder, a also beneath the beams lying above the post, or to separate stiffening beams below the girder and extending in the same direction as the beams.

Note 277. From Paulus, E. Die Kunst- und Altertumsdenkmale im Königreich Württemberg. Neckarkreis. Stuttgart. 1889.

Note 278. From Schäfer, C. Die Holzarchitektur Deutschlands. Berlin. 1888 et seq.

With substantially greater expense the beautiful wooden post (Fig. 390) from the old Royal Palace at Munich is decorated by carvings. Another example of dry and powerful nature from the National Museum at Munich is added in Fig. 391. Others are given in the repeatedly mentioned work of Schäfer.

The fanciful decoration, at the same time poor in effect, of wooden supports by variously rhaped chamfers and notching of the angles, as frequently common today as a heritage of t the 19 th century, does not correspond to the skilled artistic sense of the middle ages. Simple chamfers were only utilized for the formation of clearly octagonal shafts as in Fig. 390. If a richer effect were desired, then the shaft of the support was beset between base and capital on all sides by m members easily formed with the narrow saw (Fig. 389), or were more lavishly treated by deeply sunken carved work. (Figs. 390, 391). The chamfering of the shaft here mentioned is often found connected with its reduction to a slender octagonal support, or with richer ornamentation.

Besides the wooden posts, although more rarely, we also find stone columns for supporting the ceiling girders. Likewise braces are also occasionally connected with these, as on the late Romanesque wall posts of the Imperial Palace at Goslar, (Fig. 392 [279]), whose braces were renewed in the 15 th century, and as may be seen on the plainly beautiful isolated piers of the Kaufhaus and City Hall at Coblenz. Other wise men preferred such simple expedients, as appear on the fine sandstone column of the Abbot's house at Maulbronn.(Fig.393).

Note 279. From Die Kunstdenkmäler der Provinz Hannover. II Reg. Bez. Hildesheim. 1 & 2. Stadt Goslar. Hanover.1901.

296. Sheathed and Paneled Wooden Ceilings.

Besides the development of beam ceilings based on working ideas, which we have pursued in the preceding, there occurs a different tendency, which lays less stress on emphasizing a structural necessity. Not always, and especially not in s small and low interiors, could men employ the large timbers; for it was next to cover these by a flat surface. For this purpose indeed, the entire spaces were filled with loam on s sticks, so that the beams were flush with these surfaces, or were even covered with plaster like those. In better constr-

construction, such a lower surface was covered by wooden sheathing. In the simplest case, this sheathing is "lapped", i. e., each alternate board -- generally with moulded edges -- is laid on the boards next it at each side. Such ceilings w were mostly decorated by alternating bands of animated painting. The ceiling from Castle Reiffenstein in the Tyrol (Fig. 394 [280]) may personify the effect, although differently constructed by the insertion of longitudinal boards into grooves in the slender beams. More ornamental becomes such a sheathing, if the boards are placed beside each other and the joints are covered by battens. These frequently take the form of small beams of semicircular section of 3.2 to 5.1 ins. diameter, which at the ends as also indeed in the middle, pass into the rectangular form; at these places they are quite thin, and then again permit the entire ceiling to be covered by painting, as this occurred in the 15 th century in a room in t the Castle at Nuremberg. (Fig. 395 [281]).

Note 280. From Paukert, F. Die Zimmer-Gotik in Deutsch-Tirol. Leipzig. N. D.

Note 281. From Heideloff, C. Die Ornomentik des Mittelalters. Nuremberg. 1844-1852.

In very long rooms, in which the boards and battens could not extend from end to end in one piece, a transverse batten was inserted at the continuous joint of the boards, or a boa-
319 rd treated like a band, these transverse divisions being also strengthened by several layers of moulded boards and battens. But also by the battens could be formed parallel or oblique squares, hexagons and other subdivisions of the panels, bands etc. If these members were deep enough, they could be fasten-
320 ed directly to the beams, then joining the paneling, receiving in mortises the dividing timbers. Finally appeared also carvings, especially rosettes for the intersections of the o battens, bands, shields of arms and other ornamental work for the surfaces of the panels, all frequently further enhanced
321 by rich painting and gilding. We give in Fig. 396 one of the costly ceilings from the so-called Golden Hall of Hohensalzburg, [282] and in Fig. 397 the carved roof in the Jochel's Tower at Sterzing, [283] which latter in its uniform richness already feels the omission of the contrast of more quiet surfaces re-

required for the effect. Beautifully carved ceilings of this kind are found in the Bavarian National Museum at Munich; another from the Palace of the prince bishop of Augsburg at Füssen with carved figures has been published by Heideloff.[284]

Note 282. From Schmidt, O. Die Veste Hohensalzburg. Pl. 5. Vienna. 1886.

Note 283. From Paukert.

Note 284. Die Ornamentik des Mittelalters. Heft. 23. Pl. 7. Nuremberg. 1844-18.2.

297. Wooden Ceilings of curved Form.

As a special variety of wooden ceilings are finally to be mentioned those, which assume the form of a tunnel vault. T They are found in Germany, curved in segmental lines, not rarely in the late period, and for the mostly low rooms, they form an extremely beneficial upper termination. Their surfaces are treated like flat ceilings, i.e., they are subdivided by longitudinal beams or battens; on the principal axes are regularly strengthening arches, frequently resting on rich s
322 supports with carvings. Rooms up to about 19.7 ft. wide or
323 even larger are spanned by them in their free swing, as in t
324 the old hall of the City Hall at Munich. In wider rooms supports are either set beneath the crown of the vault, as represented in Fig. 398 for the refectory of the Carthusian Monastery at Nuremberg, and as in richer equipment with carved work on the posts and transverse beams is shown by the winter refectory at Bebenhausen.

Very much more grandly are treated curved wooden ceilings in the Gothic rooms of French castles, when they were extended in the form of pointed vaults high to the roof. Fig. 399 gives from a drawing of Viollet-le-Duc [285] a view of the vast hall possessed by the Castle of Coucy, a room not less than 52.5 ft. wide, 196.9 ft. long and 78.7 ft. high to the ridge of the ceiling. In Germany the hall of the City Hall at Nuremberg and the old citizens' hall of the City Hall at Mülhausen in Thuringia form a weak imitation of those mighty halls, though with greatly reduced dimensions, corresponding to the generally inferior conditions of former Germany. The magnificent and richly constructed ceilings of this art extending to the roof in England have already been mentioned in another place.(Art. 75). Note 285. Viollet-le-Duc. Vol. 3. p. 255.

Chapter 9. Vaulted Interiors.

298. Monastic Interiors; Chapter Halls.

Besides the halls furnished with wooden ceilings, vaulted
rooms likewise play an important part, particularly in monas-
tic architecture. Also in them it depends only upon the wid-
th of span and the boldness of the architect, whether the en-
tire space is covered in one span, in one or two, or even as
in the grand refectory of the Monastery of Georgenthal in Thu-
ringia[286], three rows of columns supported the vaults in sev-
eral lines. A certain contemporary change indeed occurs, th-
at at the beginning of the development in vaults of lower ro-
oms, men did not yet possess the certainty of the later time,
and therefore preferred a division into small bays. Thus the
chapter halls of Romanesque monasteries, which have the toler-
325 ably constant dimensions of about 30 ft. square, are as a rule
divided by 4 columns into 9 square bays. Their cross vaults
are at first without ribs; the supports are also frequently
severe and earnest in form, as in the chapter hall at Bromba-
ch, one of the oldest in Germany. Elsewhere and especially
in the Saxon monasteries, it was preferred to decorate these
326 supports most charmingly on shafts and capitals, an example
of which is given in Fig. 400 [287], from the chapter hall of
the Monastery of S. Egidion at Brunswick, now arranged as a
Museum room. The architectural form thus produced was then
more fancifully and more strongly developed in the 13 th cen-
tury by the introduction of ribbed vaults. Excellent exampl-
es among others are the halls of the Cistercian foundation of
Heiligkreuz and that at Romersdorf near Bonn, the latter, as
well as that at Altenberg near Cologne, having great beauty
of proportions. The like form was also decisive in the Goth-
ic period for chapter halls by force of custom; rarely was e
employed the then secured ability for vaulting greater rooms;
unusual is the lengthy form of hall in two aisles found in t
the Castle of the Order at Marienberg and in Maulbronn. (Fig.
13 [289]).

Note 286. Denkmalpflege. 1906. p. 93.

Note 287. From Denkmalpflege. 1906. p. 91.

Note 288. From publications of Wiener Bauhütte.

Note 289. Similar, but with simple cross vaults in Fonten-
ay. See Viollet-le-Duc. Vol. 1. p. 274.

Rather to the usual square plan adhered the chapter hall at
Eberbach in the Rheingau, vaulted with a middle support (ori-
ginated by the rebuilding of an earlier hall with nine bays),
and at Zwetl in lower Austria.(Fig. 401 [288]). The room is e
evidently again square and one column supports four cross va-
ults, that have projecting ribs, a proof that the arrangement
before us already falls in the beginning of the 13 th century.
Very peculiar is the treatment of the springing, where the o
placing of the 8 heavy ribs on the slender shaft of the colu-
mn is perhaps somewhat detailed, but is done with very bold
and attractive effect. Similar solutions in somewhat advanc-
327 ed forms are found in Schönau near Heidelberg and in Beberhau-
sen; the accenting of the springing by strong corbellings of
alternating forms is generally a frequently occurring tenden-
cy in the 13 th century.

299. Vaulted Halls.

As an expressed contrast to the severe solemnity of this m
monastic hall, we exhibit in Fig. 402 [290] a room of similar
plan out of the developed Gothic period, from the Renneberg
in upper Hesse. Here it is no longer sought to emphasize the
opposition between support and burden; light and apparently
independent spring the graceful coved ribs from the slender
middle column without any capital. Deep window recesses, wh-
ich irregularly admit light from different sides, strengthen
the comfortable and entirely secular impression of the apart-
ment, which is also undisturbed in its harmony by certain ir-
regularities of plan and of the treatment of the vaults. As
a distinguished counterpart may finally be reproduced here t
the noble hall (Fig. 403 [291]), that forms the summer refecto-
328 ry of the Grand Master in Marienburg. The beautiful proport-
ions of the interior, the noble lightness, with which the gr-
anite middle support seems to bear the vaulting, the rich ar-
rangement of the ribs of the vaults, together with the master-
ly arrangement of the abundant lighting, make the room a most
wonderful show piece of mediaeval architecture, even in the
bareness of its present internal equipment.

Note 290. From Bou- und Kunstdenkmäler von Hessen. Provi-
nz Oberhessen. Kreis Büdingen. p. 263. Darmstadt. 1890.

Note 291. From drawings of the Messbildanstalt.(Survey).

For a more cheerful harmony than the chapter halls are also the assembly halls and refectories regularly designed in the cloisters. Frequently, as in the Monastery of Heilsbronn, in the Castle of the Order at Heilsberg, etc., a great vault extends over the entire width, but as a rule it is divided into two aisles by a row of supports. Occasionally are found such restricted proportions of rooms as that of the Monastery of Michaelstein in the Harz, or the laymen's refectory in Maulbronn and Bebenshausen; but as a rule the wealth of the monastery and its eminent rank finds conscious expression in these refectories. Thus the refectory at Schönau near Heidelberg, later transformed into a church, rises to a very free and light effect (Fig. 404 [292]); still prouder and more festal appears the refectory at Maulbronn.(Fig. 14). It is covered by a cross vault with six compartments, so that both on the wall as on the row of isolated supports, thinner and stronger columns or wall corbels alternate with each other. In order to have all transverse arches reach equal heights in spite of t the different spans, the narrower side arches have been very strongly stilted. Their springings are accented by a special impost in the form of a ring around the shaft.

Note 292. From Moller, G. Denkmäler deutschen Baukunst. Darmstadt. 1815-1832.

301. Halls at Noyon and at Marienberg.

In general also in these two-aisled vaulted rooms the endeavors of the later time tend to an always more slender effect. From France we give in Fig. 405 [293] a beautiful hall from the Cathedral Foundation at Noyon, an interior in which in a singular way with the noble ecclesiastical dignity of the hall harmonizes the plain fireplace, which indicates a use for se-
329 cular living purposes. Of similar slenderness, but which by the absence of all impost mouldings is even enhanced in impression, is the wonderfully light hall of the summer refectory in Bebenhauses. But the grandest effect of this kind is produced by the magnificent hall of Marienberg. Fig. 406 [291]. T The rich subdivisions of the star vaults unite here on the s slender granite columns an entire bundle of similar vault ribs, which radiate fanlike to all sides, and by their rich play of lines and bold span have aroused the astonishment of laymen

and of wondering recognition of tradesmen at all times, and even when the gothic style passed as barbaric, found the appreciation of the best of men.

Note 293. From my own photoghaph.

302. Richer Forms of Vaults of the Late Period.

With the close of the middle ages, there everywhere increased the use of richer forms of vaults, not only in smaller r rooms, but also in larger halls. Particularly the Saxon castles in late Gothic are found equipped with the most developed plans of vaults, that are mostly executed without ribs, b but with very small compartments as the so-called cellular v vaults. We represented on the Plate near page 109 the Albrechtsburg at Meissen with its richly vaulted rooms and halls. Likewise without any decorative ornament, they are very effective by the peculiarity of their lines, by the depths in the cell-like compartments of the richly arranged star vaults and by the effects of light, which result from the deep window recesses. In the great room in the third story, we see contomporaneously how even rooms over 32.8 ft. in span were covered by single vaults in favor of a spacious effect. Such vaults of wide span in the rich forms of net or star vaults form a special pride of the 15 th century. A good example is the beautiful conversation hall erected in the year 1495 in Maulbronn, which is inserted between the abbot's house and the cloister proper. (Fig. 407 [294]). It is a hall about 19.7 ft. wide and 55.9 ft. long, which is covered by 6 bays of net va-
330 ults. It receives abundant light through the triple windows of the south side, and it contains the picturesquely enclosed winding stairway leading to the upper story.

Note 294. From Poulus, E. Die Cistercian Abtei von Moulbronn. P. 78. Stuttgart. 1890.

303. Wladislaw Hall at Prague.

Entirely outside the series stands perhaps the last mediaeval palace structure; the Wladislaw hall in the Palace at Prague (See Plate next page 332 and Fig. 408 [295]), both for its magnitude, as well as the mode of its vaulting. It is a work of the master Benedikt Ries from Pisting in lower Austria, w which the Chechs liked to name Benesch of Laun, from his later residence in Bohemia. Approximating it in the spirited c

course of the lines and in the overcoming of the numerous difficulties, which resulted from the construction, indeed only of the noole hall, that occupies the projecting corner building in the Castle of Meissen. One may see in it indeed the direct ancestor of this hall, and thereoly place it in the s series of forms and ideas of the late gothic school of upper Saxony.

Note 295. From the publications of the Wiener Bauhütte.

At the Wladislaw hall the vault begins not very high above the floor, spans 52.6 ft., is arranged with axial lengths of 39.4 ft. and a height of 42.7 ft. to the bosses, and oy the
331 ribs of the net vaults also forming circles on the plan, is suodivided with great charm and animation. The hall is 196.9 ft. long and is divided into 5 bays. In each bay is a great double window with stone cross between the wall piers. The impression of the hall is a very powerful one. The great dimensions of all details, as well as of the windows, contribute to heighten the grandeur of appearance. This hall likewise needs no further decoration to produce a grand effect, although master Benedict, when he created the work, certainly did not intend that such should be omitted.

304. Corridors and Lobbies.

To vaulted rooms also belong the connecting passages and lobbies, since they generally possessed an artistic treatment. We have repeatedly emphasized, that they possessed but small
332 importance in the middle ages, and thus those with better treatment were quite rare at first. Cross vaults or richer forms in a later time also usually form their sole decoration. Only quite excelptionally, as in the looby of the Grand Master's residence in Castle Marienberg, represented by Fig. 409[291], are they raised to higher rank by windows with tracery and a boldly conceived treatment of the supports.

305. Kitchens.

A special group among vaulted rooms is formed by the kitchens. The hearth with its fire became of old the centre of t the house; as the gathering point of the family, it was the sacred symbol of domestic life, and house right of the free man, "his own hearth" became the expression for the entire house. Thus it remained under many conditions until today.

But the much closer relations, which the greater naturalness
of life in the mediaeval kitchens and daily life produced, g
gave to these an importance, that extended far beyond the mo-
dern and was vividly expressed in the architectural monuments.

306. Kitchens in Monasteries and Castles.

Our inexhaustible source for the study of the architectural
arrangements of the 19 th century, the plan of S. Gall, shows
us a square drawn in the midst of a series of buildings, whi-
ch was sometimes designated as "focus" (hearth) or "locus fo-
ci" (place of the hearth). Therefore we may also indeed ass-
ume in the others, that the similarly drawn square or rectan-
gle in the house of the ox or horse boys, that of the swine-
herd and others of the monastic community also were their he-
arths, on which they likewise prepared their food, as they
warmed themselves, and if in the house of the groom benches
are drawn around it, this shows that the people sitting arou-
nd in this kitchen, which formed the principal room of the h
house, also ate their meals there. We indeed then have in t
that monastery a very considerable number of cooking places;
for besides the proper kitchen of the monastery there is a f
formal kitchen also connected with a series of buildings, two
of these in particular with the two divisions of the hospital
at the eastern side, then in the house for receiving travele-
rs (hospites); but we further find in all the different hous-
es for all purposes of living, such hearths in the chief roo-
ms. To these are further added the plan of the baths, to wh-
ich a considerable development was assigned, after the Roman
custom, and in each of these a hearth for heating water occu-
pies the middle.

The principal kitchen of the monastery is arranged in a rec-
tangular room lying near the refectory and connected with it
333 by a passage, whose interrupted course indeed indicates, that
it was furnished with two doors in order to not allow the od-
or of the kitchen to penetrate into the refectory; it is mar-
ked as the "passage to the kitchen". The kitchen shows 4 col-
umns, connected by 4 beams or arches and supporting the chim-
ney hood as a great vault. The square in the middle of the
room is not designated as "hearth" (focus), but as "furnace"
(fornax), perhaps evidence that it was not merely an open he-

hearth. Around this are drawn 4 rectangles between the columns, perhaps tables on which the food was prepared. Benches or tables extend around the hall. A passage connects this building with a second and larger rectangular one, which is divided into several rooms bearing the general inscription:- "here is prepared the food of the brothers with decent care", while separate inscriptions give the purpose of the different rooms, such as; "living room of the slaves, i.e., of the kitchen servants", "bakery of the brothers", "meal storehouse". Adjoining the bakery is the oven. The kitchen occupies the angle of the main building, and with its necessary rooms extends into the group of the houses of the hand-workers. One of the rooms with 4 columns, like the kitchen, is also here designated; "here is made the beer for the brothers".

With similar importance in the old plan of the Abbey of Canterbury (see Plate next page 26) are treated the kitchen and its subordinate rooms. The plan represents it as a detached domed structure crowned by a monumental chimney, in form similar to those presented by Viollet-le-Duc [296] in such grand examples from the Monasteries of Marmoutier, Vendome, etc. of the 12 th century. Such lavish arrangements, in which at the same time could be prepared on four or five hearths the food for the numerous multitude of inmates of the monastery, foreign guests, the poor and sick cared for by the monastery, naturally form exceptions and are not usually found in Germany; even for important designs, they were generally limited here to the construction of a single hearth. But during the entire middle ages the kitchens in monasteries and castles were treated architecturally with special attention. They were preferably arranged as airy and lofty rooms; the great hearth was covered by a hood for smoke placed on piers or stone isolated supports; preparing tables of stone and sinks were carefully provided. We give as an example of German development the kitchen of the Monastery of Chorin (Fig. 410 [297]), distinguished by the beautiful effect of the interior, in which the hearth extended into the room, free on three sides, now indeed with its round-arched opening walled up. Other kitchen plans of more modest dimensions with beautifully vaulted smoke hoods etc., are frequently to be found in German castles;

a good example from the castles of the Teutonic order of knights has been finely illustrated by Steinbrecht.[298].

Note 296. Viollet-le-Duc. Vol. 4. p. 461 et seq.

Note 297. From my own photoghoph.

Note 298. Steinbrecht, C. Preussen zur Zeit der Landmeister. Burg Lochstedt. p. 116, 117. Berlin. 1888.

307. Kitchens in City Houses.

Substantially otherwise was treated the arrangement of the house hearth in the city house. According to the customs of the earliest time for great and small persons, it here conti-
335 nues as actually the central point of the family, and as such finds its place in the great hall, the common living room, s sometimes in the lower story, sometimes in the upper one, as the different customs required. A separate kitchen therefore did not exist in the mediaeval city house; only the later time by partitions and separations of varying kinds destroyed this close connection of house hearth and living room. We m might also assume it as such a change in the later time, that in Cologne it became the custom to erect detached small kitchen buildings in the court, which were connected with the dining room in the house by a small passage. Similar conditions in Italy are indicated by the statement of Essenwein, how about the middle of the last century as a guest of the then bishop of Verona, he enjoyed an excellent meal in a hall, separated from the still mediaeval kitchen by a partition supported by marble columns, and how the table was so placed, th that the eye of the master constantly rested on the hearth, and his butler from the table signaled to the kitchen servants, while the guests could enjoy the preparation of the food and the work done in the kitchen. It is to be hoped, that those beautiful kitchens still remain, with the mediaeval custom of dining in them! It is then stated, that in the bishop's house only actual festal meals were taken in the hall of the house.

Chapter 10. Domestic Chapels.

To mediaeval life the regular practice of devotion was as necessary as the daily bread. In the most modest house was a corner with the image of a saint, inviting to prayer, with a chapel in those of only the moderately great. This chapel was larger and more richly equipped, the more the owner was able to do this. In palaces and castles were often several, so many persons lived in the castle, which had its own quiet residence, and these required its own chapel. These domestic chapels occupy a special place in the history of architecture, and if they are also frequently dependent on church architecture and were developed with it, still again entirely peculiar conditions determine them, since as a rule they do not occupy separate buildings, but mostly are suitably placed in t the midst of the other living rooms. Where they occupy a separate building, like a tower, as in many castles, other rooms are arranged above and beneath them, partly of an entirely s secular kind, such as storerooms or platforms for defense against enemies. Sometimes the chapel is reduced to a little apse, added to a vestibule, corridor or stairway, where life often proceeds in an entirely secular manner. Fig. 113 gives such an example in the plan of the ducal residence at Meran.

The proper house chapels were indeed the rooms consecrated as places for the devotions of all or of certain occupants of the house; but they were not churches in a public sense; not all ecclesiastical ceremonies could be conducted in them, but only those which might occur anywhere; or those for which fr-
336 om time to time special permission was given for the acts thereby allowed, whereby indeed for this case they were declared a branch of the parish or bishop's church, authorized for the proceeding.

The number of chapels of this kind remaining to us is indeed great. In part must be counted here independent churches, of which we only know now, that once they had the purpose of the house chapel. Thus may have been particularly such buildings, which stand beside great churches, partly house chapels of bishop's palaces, of foundation houses and similar plans. Of the Minster at Aix-la-Chapelle as well as of the Church of S. Sophia at Constantinople, we know indeed, that they

were palace chapels. Yet such designs of this kind will not be treated here. Only such chapels will be mentioned, which are found in the interiors of buildings, that in general have only a secular purpose. There remain of these even a sufficient number, even if we exclude all those palace, castle and house chapels, that as independent buildings are incorporated in a greater arrangement, as for example the chapel of the K Kaiserburg at Eger, that of the Castle at Vayda-Hunyad (Fig. 70, Heft 1, 1 st edition), that of the City Hall at Cologne etc.

309. Chapels with small projecting Apses.

If we return to house chapels in a narrower sense, it is n not possible to indicate the earliest of these chapels. The preceding Heft of this "Handbook" illustrates several castles, which date from the close of the 12 th century, in which such chapels occur. Thus the Trifels in Fig. 37 shows a projecting little apse on its tower, that belongs to the chapel, that appears in ground plan and elevation in Figs. 104 and 106; likewise Figs. 108 and 109 of that Heft make known the two s sections of a chapel in the Castle tower at Friesach. It is surprising, that we cannot establish such in the Niederburg at Rüdesheim; it may have been in the part of the Castle no longer existing. The projecting small apse of Castle Landsberg (Fig. 70) must indeed have contained merely an altar in the hall of the palace. Quite similar as on these castles w was a chapel of the Kamperhof in Cologne, 299, recently torn down.

Note 299. See Köln und seine Bauten etc. p. 80 (Fig. 59). -- The chapel is also described by Reichensperger and illustrated in Bock, F. Rheinlands Baudenkmale des mittelalterliche Köln. Cologne.

310. Double Chapels.

All these chapels are vaulted, partly having but one and o partly two cross vaults of important dimensions separated by a transverse arch; at the eastern side is a small apse. A l later rebuilding in Friesach occurred; a great pointed window stands behind the altar, and it is not at all improbable, that in its place originally existed also such a little apse. The chapel of Trifels therefore was of particular importance, since in it were temporarily preserved the imperial insignia,

and in the anteroom furnished with a fireplace, the guardian priest had his dwelling. The chapel at Friesach still exhibits the remains of beautiful old mural paintings of the 13 th century, as well as two doorways on the north side, which lead into the open air, thus formerly to a defensive gallery, externally constructed of wood. Accordingly the chapel had to contribute to the defense against an attack on the northern side, corresponding to the character of the entire tower.

337 A peculiar place is occupied by the chapel on the east of the palace of the Castle of Nuremberg. It is indeed placed in a separate building; but even if access to the lower chapel is assumed to have only been from the exterior and indeed outside the inner enclosure, its upper story still stands in direct connection with the hall of the palace structure, the manhood's hall, from which leads a formal portal to it, while from the upper hall, the judgment, government and festal hall, a doorway goes to a gallery, from which one might look down into the chapel and participate in the divine service. On t the contrary, the apse then lies in a tower, whose upper story was indeed constructed otherwise than the lower portion, so far as it belonged to both chapels. If the position of t this tower did not indicate, that such was previously necessary there for the defense of the castle, one would be justified in believing, that the entire construction only occurred later, and that the entire chapel with rectangular choir and without apse was among the independent structures. It is substantially unimportant in which separate class we place this chapel. It was distinguished as a "double chapel" by one of the later writers, and thus demands particular attention.

311. Chapels in Crusaders' Castles.

That the house chapels of the crusaders' buildings, particularly in those of the orders of knighthood, played an important part appears self-evident, so that occasionally the question again occurs, where such a building is properly classed. The Castle of Chastel-Blanc has a principal tower, whose entire ground story is occupied by a great chapel (Fig. 409 300), whose considerable height produces the impression, that the entire structure is a chapel building; and yet the great height was only chosen for the reason, that the tower should

have the necessary height and the defensive platform be sufficiently elevated. Above the chapel is arranged a room in t two aisles with cross vaults, which may well be regarded as a dormitory for the knights as a palace hall, since for example, it is larger than that at Nuremberg. Over it is then t the defensive platform. Beneath the chapel lies the cistern. Also likewise the lower room of the Castle tower at Giblet[301] may have served as a chapel, similarly to the vast main tower of the Castle of the Templars at Tortosa[302], whose magnificence was praised in the year 1211 by Wilbrand von Oldenburg. We might indeed judge from the massive slopes at the base, t that the existing remains no longer belong to the tower seen by Wilbrand, but that the present structure was first erected in the 13 th century, since the Templars then possessed their greatest splendor, and could hold Tortosa until the end of t the 13 th century, one of the last points they had to abandon in the East. In the Castle of Krak of the order of S. John, the chapel lies in a rectangular tower, that differs from the others by the slightly chamfered angles, and belongs to the inner line of defense.(See room H in Fig. 54 of the preceding Heft). In Castle Starkenberg of the Teutonic order it must also have been placed in the main tower. (See room D in Fig. 53 of the same Heft). The considerable size of all these chapels was connected with the great garrison on the one hand, and with the obligations of the knights on the other. But
338 then everywhere may have been connected with these castle chapels the character of a parish church for the garrison, which did not occur in European castles. There the parish church generally lay outside the castle, if it were not within the outer enclosure, as at Nuremberg the Walpurgis Chapel was on the first terrace of the hill, at Friesach the Church of S.
339 Peter, or the inhabitants of the castle belonged to the parish of the nearest village.

Note 300. From Rey, G. Etude des monuments de l'Architecture militaire des Croises en Syrie et dans l'Isle de Chypre. p. 85; Pl. 10. Paris. 1871.

Note 301. See Figs. 87 to 99 in the preceding Heft of this Handbook, 1 st edition.

Note 302. See Fig. 51 in the same Heft.

Note 303. See Figs. 54, 55 in the same Heft.

312. Chapels in German City Halls.

If we omit so many other chapels, from which we gain nothing, and continue with the consideration of house chapels existing in Germany, we turn first to the little apses of the h hall of the Nuremberg City Hall. It is unknown to us that a any other chapel may have been in the building. Thus in fact it is not surprising, and entirely corresponds to the before mentioned practice in many castle buildings, that this altar space was built in the hall, and which again by ancient tradition found its place in a projecting small apse. The simple apse (Fig. 224) with its slender form and slight projection on a simply located corbelling and with a stone roof is extremely plain in treatment of forms. This may appear singular for the wealthy city of Nuremberg, but finds its explanation in the generally plain conception of the structure externally, and its equals in so many plain chapel apses of castles and monasteries.

At Cologne City Hall we can conceive the original eastern side next the old marketplace, that of the 14 th century as similar to that of the eastern side of the hall of the Nuremberg City Hall. Perhaps the little apse was just as plain a and simple as that at Nuremberg, since without motive certainly the rebuilding of the side toward the marketplace and of the little apse in the beginning of the 16 th century would not have occurred, and when the City Hall had long had its beautiful separate chapel, there was scarcely any reason for a new arrangement of an apse.

313. Chapels at Castle Karlstein.

Quite particular attention is deserved by the various chapels at Castle Karlstein in Bohemia, since evidently Karl IV twice rebuilt the entire castle. On page 138 of the preceding Heft (1 st edition), in Fig. 78 is given the plan of the castle, and reference is made to the peculiarity of the plan, the existence of two principal towers N and S. It is also s stated, that the castle neither dominated nor protected the vicinity, that it must represent a sort of Castle of the Grail to preserve the treasures and insignia of the dignity of the emperor, who already was then king of Bohemia in the first p place. Accordingly his treasures were grouped in two divisions;

the Bohemian royal treasure, as well as the relics and the i
insignia of the Holy Roman Empire, commanding such reverence
as remained for the latter. These two treasures were placed
in the chapels, and indeed we err not in assuming that the l
lower one N, which was connected with the dwelling of the em-
peror, contained the Bohemian royal treasure, the upper one
S the Roman-German, which already according to estimation st-
ood much higher, but still no longer properly had any actual
importance; for as king of Bohemia, Karl could permit the er-
ection in the lower one, the Maria chapel in the first castle
tower, of a collegiate foundation, that consisted of a dean,
four canons and five choristers, thus of ten ecclesiastics,
while the Holy Cross chapel in the upper castle tower retain-
ed the ideal but not precious privilege, that besides the de-
an of the Karlstein Maria chapel, only bishops might read the
mass at its altar. It is also characteristic that besides t
the court of the castle only 20 soldiers and the 10 ecclesias-
tics formed the garrison, and that 22 tenants of the adjacent
properties had to appear in case of danger for the defense of
the castle. To the fact that the collegiate chapel was corr-
3. espondingly endowed is it to be attributed, that it always re-
mained in use as a church room, but that it must follow the
change of taste of the time, and so lost its original equipm-
ent, and that the upper stories of the tower having been rem-
oved, this no longer retained that character, while the upper
or Holy Cross chapel became unimportant, since about 70 years
after the erection of the castle, Sigismund gave to the impe-
rial insignia another fixed home, and it remained in the anc-
ient condition, as Karl furnished it in the middle of the 14
th century. -- But also a third chapel is still found in the
castle, the particular place for the domestic devotions of
the emperor.

314. Chapels in the City Hall and in the Karolinum at Prague.

Of salient importance is again the chapel in the City Hall at Prague, an oblong aisle adjoining a larger room, and with three cross vaults in width and one in depth, attached to it being a small choir with 5 sides and 5 Gothic windows and the usual apsidal vaults, which externally was supported by a rec-

rectangular pier and supported on corbelling, thus continuing the old tradition of these little apses.

Also a second similar one of quite considerable dimensions is found in the Karolinum at Prague, an entirely modernized building, of which only now remains the mediaeval apse of the house chapel.

315. Chapels on Nuremberg Houses etc.

Already in Art. 120 was mentioned the little apse found in the Schlüsselfelder House at Nuremberg, a room with horizontal ceiling, that indeed formed the festal hall of the house, and has at its eastern side on a corbelling the little apse between two windows with tracery, to be seen in Fig. 127, and which till relently bore an ecclesiastical character in the pointed windows. These pointed windows have been transformed in our time into those with horizontal lintels; but aside from the fact that Heideloff still saw them, one can also now recognize and see their outlines, even if all joints are not freshly tinted and painted. The little apse rests on an extremely graceful corbelling, has relief ornament on the window parapets with a lantern on the apex of the roof, in which could be placed an ever-burning light from the living room above it, which served as a dead light for the cemetery of the Church of S. Lorenz.

Still remaining in Nuremberg is the apse of the house chapel of the residence of the provost of S. Sebald, that formerly served as the parsonage of the Church of S. Sebald. Today a living room adjoins it; a former chapel must have once existed. Likewise on the old parsonage of S. Lorenz a similar l little apse was in the court, arranged toward the East, which after the removal of the building and its rebuilding by Heideloff, was again rebuilt on the north side, although somewhat changed, but still using the usable old portions. Among the great number of former house chapels of the 15 th century in Nuremberg we mention still only that, which was to be found on the corner house of the present Adlerstrasse and Hörmann's Alley, but which some decades since was removed and sold by the owner at that time, then being rebuilt on the Wartburg. Its walls were entirely paneled in the also described simple manner, and indeed each panel bore between two bands the ima-

image of a saint standing on a corbel. The ceiling was shaped like a tunnel vault and was painted blue with gold stars. The little apse projected into the court and was likewise built of wood, accordingly being furnished with a wooden vault.

In several houses of the city were smaller and partly vaulted house chapels, rooms with plan like a passage, without a special altar space. Similar vaulted and non-vaulted chapels existed and are still to be found elsewhere, as in Regensburg, Amberg etc. Likewise our plan of the ducal House at Meran (Fig. 113) and that of the Ehinger House at Ulm show the locations of the ornamentally vaulted house chapels.(Fig. 120).

316. Chapel at Cologne.

Peculiar to all examples previously mentioned is determinative the direction toward the East. This eastward direction however could not be maintained everywhere for the entire chapel; men did not hesitate to place the altar at the longer side, so that the priest standing at the altar could face the East while reading the mass. Thus the frequently cited work, "Köln und seine Bauten" etc. (Cologne, 1888) gives in Fig. 84 the interior of the chapel of the Schiederich House, where t the altar stands in a recess at the end of the longer side, and not at the rear of the elongated room.

317. Chapels at Perchtoldsdorf etc.

In the tower at Perchtoldsdorf near Vienna,[304] the second story is arranged as a chapel, furnished with abundant service recesses in the corners, from which rises a star vault as the ceiling of the rectangular room. A rectangular niche in the eastern wall is covered by a netted vault and has a small gothic window in two divisions with tracery, and serves to r receive the altar. An external entrance leads to the second story, thus to the chapel, through which one must pass to reach a winding stairway in its corner, extending to an upper story of living rooms in the tower. The painted cross of consecration shows, that this chapel was ecclesiastically dedicated according to rule, which must have occurred only for very few house chapels.

Note 304. See Plate next p. 189 in the preceding Heft of this Handbook, 1st edition.

Then we further wish to mention the house chapel of the ao-

abbot's dwelling at Maulbronn, since there the little apse is not palaced at the East, but at the North. Yet the altar could so stand at the side, so that it had the eastward direction, as it was once the ecclesiastical rule for every altar, even if it was not everywhere obeyed after the close of the middle ages.

318. Chapel in College Jagellonicum.

We close the consideration of domestic chapels by referring again to the Plate next page 206, where appears the little a apse of the hall of the College Jagellonicum at Cracow, whose simple form spares further description.

Chapter 11. Internal Stairways.

319. Original Lack of Ornament and Pretense.

As already stated for external stairs, men regarded stairways in the early middle ages as a means of ascent, just like a ladder. Scarcely any requirements for their convenience were established; they were never considered as an architecturally important portion of the building, that was to be especially treated in respect to space; men sought to occupy only the least possible space by them. Only in later times came to be applied to these small structures special care in arrangement and also great ornamentation in execution.

342 Very modest and quite inaccessible according to our ideas are the stairways of most castles, which mostly ascend in the smallest dimensions within the thick walls, in case for reasons of safety, men were not mainly satisfied with ladders. Thus in the interior of the imperial Castle of Trifels exist two stairways leading to the second story, in straight flights, though indeed broken at the corners, but a similar one to the third story is not to be found. Similarly unimportant in dimensions are also the stairways in the Niederburg at Rudesheim (Figs. 76, 77); in its tower is further found a winding stairway of masonry. We also see such in the almost contemporary castles of Landskron, Neuscharfneck (see p. 176, 177 of the preceding Heft. 1(t edition). Equally unimportant are likewise the stairway designs in the old Castle of Marienberg from the 14 th century, where the knights still resided in considerable numbers, and where it might be important in certain cases for them to quickly assemble in the court, to be able to ascend to,or descend rapidly from, the defensive works at the edges of the roofs. There existed only two narrow stairways at A and B (see p. 182 of the preceding Heft, 1 st edition), each being only about 3.28 ft. wide. Likewise in the residence of the Grand Master the arrangement of the stairs is very modest. A straight stairway connected the dwelling of the Grand Master with the refectory; two winding stairways in the masonry, scarcely lighted by occasional slits, conducted upwards the Grand Master and his guests, as well as to the defensive galleries.

We likewise find at Castle Vayda-Hunyad (see p. 140 of the same) only winding stairways employed as communications. Th

Their execution in all earlier buildings is the simplest conceivable, and the space thereby occupied is very small.

320. More expensive Designs of the late Period; Winding and Straight Stairways of Stone.

Only in the 15 th century did the stairways become in a manner more extensive. The Hokönigsburg in Alsace has in its p palace a winding staircase of more than 9.8 ft. clear diameter, besides other stairways of considerable importance in two other buildings. Likewise in the city houses the stairways became more important at about that time. The wooden winding stairs, that led upward into the halls, are mostly spacious and in consequence are less steep, while those with straight flights are also still quite steep. These straight stairways are also generally arranged, so that a flight above another in the same plane does not lead from story to story, as is t the case in the Nuremberg house (see Place next page 38). (For example, see the stairway arrangement in the Schwezer House at Neustadt-on-Orla in Fig. 175.).

Thus in the University at Cracow (see Plate next p. 206), the stairway from the court to the second story intersects the gallery at d; but two stairways at e and f further lead to the third story. The stairways in the Castle at Trient ((Fig. 97), which are placed in the galleries surrounding the court B, lead to another place in each story. Likewise the stairways in the House at Steyr (Figs. 191, 192) do not lead upward direltcy above each other. There are indeed not wanting straight stairways that lay claim to being actually enclosed rooms. But as a rule, they are so arranged, that each flight lies by itself between enclosing walls, whereby most lack all possibility of architectural treatment, with the exception of vaulted ceilings and rich forms of windows. Unusual is the beautiful arrangement in the House at Steyr just mentioned, where the stairway to the attic is only separated
373 by a thin lattice of stone posts and tracery from a vestibule, beside which it extends upward. More commonly already occur in Tyrolese castles developments of the kind represented in Fig. 412 [305], where the stairway with stone railing ii partly built open in the great hall.

Note 305. From Schmidt, O. Die Kunstschätze Tirols. Pl. 38. Vienna. N. D.

For saving space, as before mentioned, winding stairs were especially preferred in citadels and castles, and they frequently form a certain substitute for the lacking connecting p passages and corridors. They were particularly adapted for arranging concealed and private stairways, or such that merely led from one room to that lying over it, thus being inaccessible to every one not admitted to the room. Thus in the City Hall at Nuremberg the stairway is worthy of note, which led from the council room to the prison and the subterranean passages, and is itself invisible in the (still existing) council room, since the entrance is concealed by a wall case. Similar arrangements are also proved in other city halls, for example in Ochsenfurt, Goslar etc. A charming little stairway, built by Behaim in the first years of the 16 th century in Nuremberg,also leads to the former archives , now office of the tester of weights and measures, from a vestibule up to two upper stories. It has the peculiarity that it turns around over its own course, and the exit in an opposed direction lies over the entrance. One drawings in Fig. 413 make this intelligible.

Generally in the later time the winding stairway afforded stonecutters the best opportunity to exhibit their art. If the newel had a diameter of only about 13.8 ins., such a rich group of rounds and hollows extended around it in a slender spiral, that it aroused the astonishment of laymen; likewise, since the moulding served at the same time as a handrail, a similar one was cut in the enclosing wall. The windows in t this wall followed the slope of the winding, and if they had a rich architecture and perhaps stood quite near each other, then resulted stonecutter's art works of every kind. The edges of the steps might be curved inward or outward. The undersides of the steps might be moulded, or a single helical s surface covered with ornaments might form the underside of a all the steps. Vault ribs intersecting each other might decorate this surface or extend between the wall and the newel.

But if the inner cylinder of the staircase were so large, that an opening with a string was to be arranged instead of a newel in the middle, on which then stood three or more slender columns for supporting the upper part of the string, then

resulted a very ornamental and rich internal view, that reached its climax when the staircase to the top story was covered by a beautiful star vault. The surface of the enclosing wall, as well as the spaces between the small columns on the string presented in the railing obliquely ascending surfaces, which were suited for the designing of rich tracery; in brief, the stonecutters could then abundantly exhibit their entire art in the solving of the most difficult geometrical intersections, as well as in the invention and artistic graduation of t the most charming details. Thus they could create works in the smallest areas of 13.1 to 16.4 ft. in clear diameter, which were assured of permanent admiration. As a magnificent example of these late Gothic designs should be mentioned the main stairway of the Albrechtsburg at Meissen, whose plan has been reproduced in Fig. 102.

In Germany it was reserved to the 15 th century to enjoy t the construction of such richly treated stairways. In France on the contrary, men had earlier attained thereto, and the g great stairway erected by Charles VI in the second half of t the 14 th century in the Louvre, already shows what a splendid development the winding stairway was capable of.

321. Wooden Stairways.

Of straight wooden stairways of the mediaeval period scarcely an artistically executed example has been preserved. But from examples of the early Renaissance it may be assumed, that already in the Gothic time besides the stairs with straight inclined timber strings was also developed the form of the superimosed steps; certainly not in the form common with notched timber strings, but earlier and more properly so constructed, that wooden timber steps rested at the sides on inclined supporting beams.

Likewise wooden winding stairs have no longer entirely come down to us in the developed treatment of form. But so many beautifully moulded newels and so many strings still afford evidence of the successful endeavors of joiners to not remain too far behind the art works of stonecutters.

346 Chapter 12. Internal Finish of Living Rooms.

322. Wall Treatment in Wooden Construction; Plank Walls.

Also in the internal finish of living rooms is the treatment of the wall of substantial importance. Most simply treated in wooden construction by the natural connection with proper construction. Usually wooden bearing partitions without masonry supports were employed to separate smaller rooms in such manner, that on a horizontal timber sill matched planks 3.2, to 3.9 ins. thick were set beside each other, their tops being again connected by a horizontal timber. From the portion of the wall beside the doorway in Fig. 414 [306] may be seen t this method of construction. Already in the plainest style of work, if the planks were set to lap somewhat, like a boarded ceiling, and were beveled at the edges, there resulted s such a clear orderliness of treatment, with a comfortable effect of the interior from the warm tone of the wooden surfaces. To produce greater richness the planks were rather set in the same plane and the joints were then covered by battens, which extended between the sill projecting like a base and the upper timber, or in case the latter were represented by a ceiling beam, were returned horizontally along this. When such a wall was also furnished with a middle girt for better stiffening it, and adjoined a part of the ceiling, a doorway was naturally added in it, as shown by Fig. 414 [306], from the City Hall in Asfeld in upper Hesse. The upper termination of the covering battens was then usually formed by a wider board, which then like a frieze was best ornamented by notched arches or continuous scroll ornament. From the covering battens t then developed finally divisions by little columns with carved
347 bases and capitals; particularly the tops were often richly treated by the addition of rich coverings. A show piece of this kind is presented by the council hall of the City Hall at Ueberlingen, from which we reproduce the upper termination of the wall in Fig. 415. The work was completed about the year 1494, and the master Jacob Ruess has connected with the luxuriant ornamental carved work a thoughtfully combined series of splendidly executed free figures, which represent the officials and dignitaries of the Holy German-Roman empire, together with small corbels adorned by shields of arms.

306. From Lehmgrübner, P. Mittelalterliche Rathausbauten in Deutschland. Pl. 26. Berlin. 1905.

323. Internal Paneled Walls.

Likewise for internal paneled walls, men loved to freely e exhibit the proper jointing. The finished woodwork then either remained in its natural color, that gradually passed into a warm and soft brownish gray, or to it was given an animated and mostly dark red color, from which became strongly prominent the remaining light frescoed surface. Men were mostly s satisfied by this fresh contrast; more rarely were added colored border lines beside the woodwork or ornaments painted on the panels, as in the middle passage of the dormitory in the Monastery of Bebenhausen, whose wall treatment we represent in Fig. 416 [307].

Note 307. From Paulus, E. Die Cistiercienser Abtei Bebenhausen. Stuttgart. 1886-1887.

324. Stone Walls.

If stone walls consisted of regular ashlars, which certainly occurred only for prominent festal halls, received in the interior a treatment entirely similar to that on the exteriors of buildings. Here as there occasionally slight paintings and colored tinting of the separate members were applied directly to the stone. In case the lower portion of such walls was not covered by paneling as just described, it is to be assumed, that like also the plastered walls elsewhere, they were hung with tapestries on all festal occasions, thereby acquiring both rich decoration and comfort. In large and small tapestries, that were used for this purpose, there appears to have belonged a considerable abundance for the necessa-
346 ry equipment of each distinguished household. But far more c commonly were the walls constructed of split stone or bricks, then always being covered by plastering. Numerous statements already from the earliest time prove to us, that men were accustomed to apply painting to these surfaces, and if possible, representations of figures from history and the heroic sagas. The earliest remains of such decorations preserved to us even date from the 13 th century; they exhibit on a strongly colored lower portion of the wall simple outline drawings of knightly life, and restrict themselves to the use of the colors

everywhere at command, black, white, iron red and yellow ochre. 308.

Note 308. On the earliest Gothic mural paintings, see Weber, P. Die Iweinbilder des XIII Jahrhundert im Hessenhof zu Schmalkalden. Zeits. für bild-Kunst. 1901.

325. Paintings.

The most important example of such painted decorations from the later time is found in Castle Runkelstein near Meran, where the rich banker Niklas Vintler caused to be painted about the year 1400 an entire series of apartments with richly colored fresco paintings, representations of hunting and tourna-
349 ments, knightly sports and events from the sagas of the hero Wigalaois, from Tristan and Isolde etc., in a style borrowed from Italian art. As a rare but very effective example, the figure decorations should also be mentioned here, which formerly adorned the principal room of the Dollinger House in Regensburg. The room indeed dated from the second half of the 13 th century, was relatively low, covered by four pointed c cross vaults with broad ribs, that rested on a low pier standing somewhat outside the middle, and which supported the tower of the house. The window architecture no longer remained, but must have been painted. On the contrary, sculptures of great artistic and art-historical importance still remained, which represented mounted figures somewhat larger than life, which were modeled in the full round in stucco on the wall. They represented king Heinrich I, as well as the combat of an alleged knight Dollinger with a giant krako from the Hungarian army, that wallowed over Germany, until it was destroyed by Heinrich I on the Lech field. Sometime since in rebuilding the house with the great hall, the sculptures were removed and again erected in the Catholic Club House at Regensburg, although partly in plaster casts. An imitation is to be found in the National Museum at Munich as representative of that school of sculptors, which in the 13 th and 14 th centuries, in the city of Regensburg created a series of splendid works.

326. Mural Painting of an ornamental Kind in the Tyrol.

Under simpler conditions men were naturally satisfied with decorative ornament in mural painting, which gradually devel-
350 oped from the heavy ashlars and enclosed friezes of the Romanesque style to greater lightness and fluidity. Certain exam-

examples of this highly developed ornamental art are found s scattered everywhere; they are mostly still preserved in Tyrolese castles, so long sequestered from the world. Very characteristic is a wall from Castle Freundsberg near Schwaz in the Tyrol, which we illustrate in Fig. 417 [309]. Drawn with freedom, earthy green and reddish brown scrolls extend in great lines over the light surface of the plastering, together with conventionalized leaves and fruits; between these sport birds and other animals. More difficult is the scroll work on another wall of the same castle (Fig. 419 [309]), which at the same time affords an example of the painted enclosure of a window.

Note 309. From Paukert, F. Die Zimmergotik in Deutsch-Tirol. Leipzig. N. D.

By finer execution are distinguished the paintings of a room in Castle Reiffenstein near Sterzing (Fig. 418 [309]), to w which correspond similar and better preserved works in the d domestic chapel in Castle Gravetsch near Klausen. The entire wall is there vividly colored in a tone of rather subdued Schweinfurt green; on this is painted extremely rich ornament of band-like foliage with black lines, shaded in the same manner and lighted with white. Fine cords are branched like roots in air, and run through the great scrolls in white colors; f figure accessories and flowers are executed in bold colors a and further enrich the work.

327. Mural Painting in Bebenhausen and Fritzlar.

A particularly rich mural painting of great refinement in execution is found in the refectory of the Monastery of Beben-
351 hausen (Fig. 420 [310]). Finally to be reproduced here is further a small room from the Canons' Foundation of S. Peter at Fritzlar (Fig. 421 [311]), to make apparent the general effect of such painted ornamentation. Above a low white dado first rises a wide portion of the wall in dark red, covered by white scrolls and terminated above by a broad band of the most ornamental tracery and painted shields of arms. The upper o portion of the wall and the ceiling are substantially treated
352 in the same manner, only with dark red ornaments on a white ground and a slight change in the leaf forms. For this purpose the plastering of the ceiling was also extended over the

beams in a thin layer; it has indeed now in the greatest part fallen from the surfaces of the wood, since this was only previously prepared for its reception by a slight hacking. All surfaces of the wall and ceiling show on the white ground scroll work outlined in black with red, and also in part green leaves and bunches of grapes of varying colors. likewise the representation of the Crucifixion, that animates the end wall, is limited to the colors, yellow, red and gray, besides the black outlines. For the endeavor after the unity of the view of the entire interior, besides the treatment of the ceiling, it is characteristic, that the painting of the walls is carried quite uniformly also over the wooden door.

Note 310. From an original drawing by G. Loosen.

Note 311. From my own photograph.

328. Paneling of Walls; Division by Battens.

Greater comfort than by mere colored decoration was afforded by covering the walls with wooden paneling. We saw at the beginning of our description, that use was made of it already in the oldest palace structures of Chalemagne and Heinrich I, and we can accordingly assume with certainty, that men continued faithful to this custom in the Romanesque era also. But nothing remains to us from these earlier works; our knowledge first begins with the works of the 14 th century. In the simplest way such panelings are attached to the construction of the plank walls described in Art. 322; when vertical planks are inserted between base and frieze and battens are added to cover the joints. But freer arrangements were mostly employed. According to a kind frequently occurring in the Tyrol in particular, large divisions are arranged, so that several boards are glued to form larger panels, and thus are inserted between the wider divisions by bands. The wall of the so-called emperor's chamber of the House of the sovereign prince in Meran (Fig. 422 [312]) gives a work of a simple kind. Richer examples indeed subdivide the surfaces by more frequent recurrence of the dividing strips, as the wall paneling from Klösterle (Fig. 423 [312]) exhibits in connection with a wall bench and a very capricious form of the upper and lower ends of the panels. More common is the division of the surfaces by battens crossing at right angles, when commonly a lower portion

of the wall was separated as a high base, just as also preferred in painting. Such battens are frequently of plain profile and are then decorated by broad nail heads, or are richly treated, often indeed as the emperor's chamber in the Scheurl House at Nuremberg (Fig. 424 [313]), being adorned by friezes of woods inlaid in colors or with ornaments in low relief. The intermediate panels were also ornamented in important works. Thus in the surfaces of the wainscoting in the princes' hall at Coburg, great rosettes were inserted in inlaid work, (Fig. 425 [313]), and as an upper termination was added a perforated and sculptured ornamental frieze between the dividing
354 battens. In the golden hall of the portress of Hohensalzburg (Fig. 426 [314]) are distributed large nail heads and alternating carved rosettes in great numbers; statuettes with canopies are placed before the dividing bands, and a rich frieze terminates the panel at top, as in the preceding example.

Note 312. From Paukert.

Note 313. From Heideloff, C. Die Ornamentik des Mittelalters. Nuremberg. 1844-1852.

Note 314. From Schmidt, O. Die Veste Hohensalzburg. Pl. 4. Vienna. 1896.

329. Division into Panels with "Rolled Work".

In northern Germany it was more usual than this mode of execution, to divide the wainscoting into small rectangular panels, that were either constructed as doubled work by overlaid division strips, or were set in frames and panels. The l latter method of treatment appears to have been the only one used in France. In contrast to the panelings in south Germany, these divisions into little panels usually do not extend over the entire wall, but are limited to their lower portion for about the height of a man. While the ground of the panel must remain flat in doubled work, or at most can be decorated by sunken or inlaid ornament, men liked to give the framed o panels a relief on the surface. This consisted in the simplest case of a roof-shaped thickening at the middle, and then by added mouldings and fanciful notching of the upper and low-
355 er border lines assumed the form, which from a certain similarity to rolled and folded strips of parchment was designated as "parchment paneling" or "rolled work". One of the most im-

important works of this kind is contained in the Friedensall
(Beace Hall) in the City Hall at Münster-i-W as the rear wall
of the seats of the aldermen. On the framework it is beset
by little columns and finials, ornamented on the panels by f
figure carvings and rolled work, and is crowned at top for i
its entire width by a canopy, but the later Renaissance wain-
scoting is built over and injures its effect. It now serves
for preserving documents, and therefore its two-thirds at the
sides are furnished with rich fixtures for opening the separ-
ate panels.

330. Doors; Doubled Work.

Entirely similar methods of working as for panelings also
found employment in the woodwork of the doors -- internal as
well as external. A real difference between these did not
exist for the leaves of the doors; the agreement of the two
356 was complete, also even if cut stone or bricks were chosen f
for the jambs of internal doors, which often happened. With
the greatest unconcern, the internal doors were inserted in
the wooden partitions and wainscoting, and almost all repres-
entations of wainscoting at the same time afford information,
how the doors sometimes had plain board casings, sometimes l
luxuriously treated architraves of most ornamental carving,
and formed favored points on the surfaces of the walls. The
openings of the doorways as a rule were small and low, as pre-
357 viously emphasized, but very much to the advantage of a comf-
ortable expression. The leaves were often constructed as la-
rge board panels, held together by inserted strips, or made
of doubled boards set crosswise. Their smooth surfaces could
then be animated by carefully treated iron fixtures, for whi-
ch the doors already given in wainscotings (Figs. 422 to 426),
as well as those in Fig. 427 [315] at a larger scale, may serve
as examples. The latter door is from the sovereign prince's
House in Meran, and is furnished with rich forged strat hing-
es, a latch for fastening and a strong pull. The plain iron
transverse bar for security naturally belongs to a later time.
Very worthy of consideration as a monument of the masterly Ty-
rolese carver's art is also the finely modeled panel with ar-
ms, placed over the door proper.

Note 315. From Paukert.

Another frequently recurring treatment is shown by Fig. 428,[315] on a door from Castle Enn, where the second thickness of boards is limited to a broad enclosure of the inner surface, richly decorated by flat ornament with sunken ground. On the other doubled doors with simpler treatment of the boards appear vertical divisions, as for the plain door from the Country House at Youlgrave in Derbyshire (Fig. 429 [319]),or by crossed doubled boards and battens, panels of the most varied kinds are produced. In the late time are then occasionally developed therefrom divisions in ornamental tracery in curved lines, a mode of treatment less suited to the properties of wood, but which however has been carried to splendid effects.

Note 316. From Old Country Cottages. Special Number of The Studio. 1906-1907. p. 110.

331. Mortised Doors.

For mortised doors, a simple example is given in Fig. 430 [317] from Castle Anserweiler in Lorraine, on which the joining of the frame by tenons and pins, the mode of moulding, and especially the before mentioned thickening of the panels and the decoration by nails and its pull are visible. Richer is the door from a house in Abbeville (Fig. 431 [318]). The upper panels exhibit rolled work, enclosed by an inserted moulding; t the lower ones are perforated in a most ornate form of tracery, to permit a view into the vestibule. Such perforations are also found in Germany, either as smaller and often only slit openings, or they extend over the entire surfaces of all panels, the finest example of which is presented by the magnificent door of the chapel in Castle Reiffenstein near Sterzing.

Note 317. From Schmitz, W. Der mittelalterliche Profanbau in Lothringio. Düsseldorf. N. D.

Note 318. From Viollet-le-Duc. Vol. 6. p. 372.

332. Painting of Woodwork in Internal Architecture.

It is still to be mentioned, that indeed in the greater number of cases the woodwork of the internal architecture retained its natural tone, though commonly with colored tinting of the ground.for all carvings. Likewise the accenting of certain ornamental parts, as for example the panel of arms in Fig. 421 by the richest painting and gilding is connected with this. But in many cases, particularly for doors, strong color has

been applied to the whole, then frequently the mouldings, carvings and fixtures were raised from the ground by a vivid contrast of colors. For this is then applicable, what was said of the painting of half timber structures in Art. 222.

333. Floors; Coating of Gypsum.

The floors in the middle ages were but rarely of boards, a and this only where no importance whatever was assigned to them, as in attics, storerooms and such places, where simple boards were nailed on the tops of the beams. In halls and l living rooms from the earliest times to the close of the middle ages and afterwards, men preferably used plaster floors, chiefly composed of gypsum, except where in the country and among the poor people in the cities was preferred a layer of loam, which men could themselves prepare and also repair, when injured.

Men understood how to prepare the gypsum layer with excellent qualities. Particularly the hardness and the slight wear must have had its reason in the care with which they were treated. The degree of calcination of the gypsum as well as t the always equal quantity of water were essentially influential: after the mass had been uniformly applied and had set, it was compacted in its still wet condition by beating with
360 smooth timbers, whereby also all commencing cracks in drying were closed. As additions are found sand, brickdust and small pieces of pounded tiles, but so that always the hardness of the gypsum, which it acquired by setting, remained most d decisive for the durability and hardness of the floor. By t the addition of pounded tiles it received a red and mottled appearance. In the Carthusian Monastery at Nuremberg, it covered the floors of all rooms; it was mixed with many fragments of tiles, so that it had nearly the color of terra cotta, and where it could be examined, it was laid in a single uniform layer of some 2.4 to 3.9 ins. thick on pure sand. It seems to have been strongly tamped, so that it was extremely compact. Then it appears to have been smoothed with the trowel; it lay very even, was subject to heavy use for several hundred years and produced much dust, so that unfortunately it could scarcely be allowed to remain anywhere, and men must be satisfied with procuring a few sample pieces. Likewise a

gypsum covering of a bluish gray color is occasionally found; it was produced by mixing particles of charcoal with the gypsum, either as an impurity from calcining or an intended addition. Gypsum floors in patterns, which resulted from inserting templates in a part of the floor to form holes, then filled with material of a different color, might indeed be employed in church architecture as well as in domestic architecture; yet no examples of these have remained to us.

334. Clay Tiles.

A method was also common for animating and at the same time ornamenting floors, and this found employment in rooms and h halls during the entire middle ages, which consists in covering with tiles of burned clay, variously decorated by reliefs as well as by stamped outline sketches and by glazing in different colors. These are the same tiles, which also found such varied uses in church architecture. Therefore in order to not treat of them twice, since they were thoroughly described in Heft 4 of the preceding volume (in the details of church architecture), we refer our readers thereto. Such a floor covering, besides which also costly stone and marble slabs and mosaic were employed, was not only used on a bed of earth or on vaults, but even on a layer of beams. Our Fig. 389 shows how a layer of loam or sand was laid for them on a floor of boards.

335. Heating Apparatus; General.

To the internal architecture of buildings likewise belongs the heating apparatus. We have already emphasized in describing the general arrangement of mediaeval dwellings, that the ruder habits of mediaeval men did not require artificial heating to the modery extent. We have seen, that even prominent monasteries possessed only a single room, that could be warmed, the "warm room", that in important city halls in most cases no fireplace existed, excepting in the largest, in the house hearth burning in the draughty vestibule. One might indeed conjecture, that this lack was remedied by the abundant use of portable charcoal braziers, fireplaces etc. But whoever had opportunity to pass a winter in north Italy some 20 or 30 years since, knows how persons accustomed by established habits, likewise endure the period of winter frost without such assistance, and is inclined to attribute importance in

this respect also to the mediaeval man. Difference in countries certainly plays an important part in such customs. It may also be mentioned here, that apparently the German Alpine regions as well as Sweden and Norway already early paid greater attention to heating apparatus than was usual elsewhere, which is easily explained by the roughness and the longer duration of winter there.

But in general, the equipment with special heating arrangements remained exceptional and a privilege of the nobles; yet it does not exclude that they developed this in a quite varied and abundant manner. We can particularly distinguish between three principal forms:-- heating by hot air, by fireplaces, and by stoves.

336. Heating by Hot Air.

Heating with warmed air can certainly be referred to Roman precedents. In any case the heating arrangements, that the plan of S. Gall gives for the furnace, correspond to the hypocaust arrangement of the Romans, which is now regarded as h heating by hot air, designed to be effected by the vertical flues lying in the walls an interchange of air between the r room and the furnace room. The mode of action of such heating is indeed based on much simpler principles, compared with our present arrangements, and it approximates the action of the long known baking oven. Likewise the form was simplified
362 in the later middle ages. A strong vault was placed under the room to be warmed, that partly served as a furnace, partly was filled with loosely packed large stones, furnished with a flue to carry off the smoke. By a strong fire the wall, ceiling and the stones in the room were heated to a glow, the fire was withdrawn and the smoke flue was closed. Small openings in the ceiling, which could be opened from the upper room, made it possible to utilize the heat stored in the furnace for warming the other. Arrangements of this kind are frequently preserved, as in the emperor's House in Goslar, at t the Castle in Marburg, in the Castle of Marienburg, [319] in the Monastery of Maulbronn, in the City Halls at Göttingen, [320] Lüneburg etc.; but these designs must scarcely have found wide dissemination.

Note 319. Published by Bergau in Zeits.f.Bauw. 1870.p.106

Note 320. Heyne, M. Die deutsche Wohnungswesen. p. 242. Leipzig. 1899.

337. Fireplaces.

As the most important arrangement for warming, the fireplace asserted itself in far more general use in the entire middle ages, as already stated, and was inherited from later antiquity. It must already have formed a constant part of the equipment for princely living rooms in even the earliest period of mediaeval domestic existence; otherwise the appellation of "chimney place" (keminata, caminata) could not have become so firmly settled for such. The first mention of such a "caminata" already dates from the year 584; the article itself therefore extends farther back. In the oldest representation of a mediaeval residence, the plan of S. Gall, in the corners of the better living rooms are found indicated very numerous heating arrangements, that are best explained as fireplaces.[321] This is indeed not the arrangement, which is designated on the plan itself by the word caminus (fireplace); this rather denotes the before mentioned heating by furnace (calefactorium), evidently from the distance between fireplace and smoke flue, an air-heating hypocaust according to Roman methods. What we regard as a fireplace, like the probably vaulted kitchen hearth (Art. 306), is in part designated by fornax (stove); it is very evident that these expressions do not here possess the fixed and limited sense, which we later find assigned to them.

Note 321. It should be mentioned, that others desire to r recognize stoves in these indications; a decision on this must be difficult as well as of no great importance. The reason suggested by Heyne, that stoves can be built in wooden houses better than fireplaces, does not seem to hold good from a technical standpoint.

363 Moreover the construction of such a fireplace can be very simply stated; a hearth for the fire with any sort of a smoke hood, even of wattle coated with clay, would entirely satisfy the needs of simpler times. Likewise the stone fireplaces r remaining to us from the 12 th century often exhibit the plainest forms, as for example the fireplace from the Castle tower at Friesach in Fig. 432, and such simplicity in treatment

is often due to obvious reasons in structures for defense and utility. On the other hand, the form of fireplace afforded the best opportunity for creating a splendid central point of the decoration in state rooms, or for lending dignity and comfortable richness to inferior and otherwise entirely plain r rooms. In all times have been artistically treated with great care, both the properly structural parts of the fireplace, the corbels with supporting posts and the smoke hood, as well as the artistic equipment, the wrought andirons for receiving the logs of wood, the fire tongs and poker. On the adjacent Plate is given the fireplace wall from the lower hall of the Palace at Gelnhausen, where not only the corbels and columns, but also especially the rear wall of the seats beside the fireplace is covered in the richest manner with rich stonecutters' work, with decorated members, interlaced work and plant ornament. In the interwoven bands we again find the same forms, that were developed centuries earlier in the late Byzantine-Lombard period, and which were long retained in Italy. Later times continued the rich treatment of the fireplace in its ornamental forms with rich bands on the supporting beams of the fireplace hood with figures and also with rich blind tracery on the surface of the hood. Particularly the 15 th century produced important show pieces of this kind, and by these works left behind a strong incitement to Renaissance a art to very magnificent undertakings. We reproduced in Fig. 433 a simpler example from Castle Vayda-Hunyad as a representative of the usual treatment common in this later time. Plainer is the fireplace from Goslar represented in Fig. 163.

338. Stoves of Masonry; Fire Pots.

Besides the fireplace, that did not exactly force its way into citizens' houses, there first appeared in German Alpine regions the stove as the source of heat, probably soon also spreading from thence in south Germany. It was also early k known in Scandinavia in a very primitive form; but an influencing of one region by the other is therefore scarcely to be assumed, since it first penetrated later from the south into the adjacent north Germany.

Stoves as baking ovens and smelting furnaces for industrial purposes have naturally been in use since inconceivable times;

but it is beyond our knowledge, when these arrangements for internal heating were first employed for warming living rooms.
364 Vestiges are found, that already occurred in the late period
365 of the antique; it is very possible, that already in the time of the Lombard kingdom stoves for rooms were constructed, and that the author of the plan of S. Gall was acquainted with s stoves. In any case until the late period of the middle ages the stove retained the plainest form of the masonry baking o oven, and the at first but timidly attempted introduction of this but clumsy heating arrangement was derived from the later general custom of firing stoves, not from the room to be warmed, but from the outside. In provincial regions and especially in the Tyrol, we still find today stoves built of stones and externally thinly plastered with lime, often in the low form of a chest with arched cover and occasionally decorated by mouldings. For more rapid transmission of heat, pots are placed here and there in the solid walls of the room to be heated, so that their bottoms alone form the separation of the gases of combustion from the room. Such pots are at first round; then are found those with tops bent into square form (Fig. 434 [322]) in which are also shown the first vestiges of ornamentation in the form of a rosette stamped on the round bottom. First from this was developed the form of the oroper square tiles with regularly raised edges, which made it possible without the help of solid masonry to construct the entire stoves with these in regular forms. For a long time the mediaeval tiles retained the strongly sunken and recessed form from the history of their origin.

Note 322. From a sketch by the author.

339. Tile Stoves.

Complete stoves, that are proved to belong to a definite t time in the middle ages, first remain to us from the 15 th c century; even usable representations, with certain information relating to the form and construction of stoves, also only preserved from the beginning of the 15 th century, but have not come to us now. Yet single tiles remain, which date from the early time of the 14 th century, perhaps even from the 1 13 th. In Figs. 435 to 438 are given some excavated at Castle Tannenberg in Hesse, destroyed in 1399, from the Museum at

Darmstadt, which may date from the beginning of the 14th century. They are shaped with a free hand like mugs, then cut into two parts, pressed on a form cut away for the front edge and variously glazed. It was possible in this way to produce a wall of considerable thickness and still affording a very good heating surface, when they were built up with clay into a round or square mass. The thin portions of this wall, the hollows of the recesses in the tiles were soon heated; the t thick parts at the junction of two tiles long retained the h heat, and since the stove was built large enough, they heated to correspond. In such manner were the tiles made until the close of the 15 th century, and in the use of the tiles kept in stock, the masters allowed free play to their caprices. They built towers with projections and recessions, together with square, round, hexagonal and octagonal portions.

Fig. 439 gives a tile, which belonged to a stove in the Parsonage of S. Lorenz at Nuremberg, on which by several succes-
366 sive recessed rows of such tiles was built a spire. Fig. 440 shows a tile for producing a projection, and Fig. 441 is a c crowning tile; both taken from a Nuremberg stove. From the Tyrol came the two tiles in Figs. 444 and 445, decorated by the arms of the Tyrol and of Austria. From a stove in the s sacristy of S. Stephen's Church at Vienna was taken the tile represented in Fig. 446. From Wurtenberg, as shown by the horn and antlers, is the tile in Fig. 442, which served for the construction of a cavetto. The back of this tile (Fig.
367 443) very characteristically explains the construction of such
368 stoves. The slender projection fixed the tile in the wall m mass of the stove, and according to whether this projection was raised by placing bits of tile beneath it or was lowered, a base or cap projection could be represented by a row of such tiles. Variegated glazing of the tiles, mostly green but with others yellow and reddish brown, was already found on t the Tannenberg and other older tiles. Varied mottled glazing of the separate tiles appears to have just appeared at the c close of the 15 th century. Of such entirely brightly colored tiles is constructed the small stove on a sandstone base represented in Fig. 447; it was in the City Hall at Ochsenfurt, and now stands in the Germanic Museum at Nuremberg. On it

369 is remarkable, that the tiles are no longer of niche form, b but are flat, as also the case in part on the famous state s stove in the golden hall of Hohensalzburg. We likewise reproduce this in Fig. 448 [323], since it exhibits the great wealth in design even better than the preceding one, that men employed on such subordinate articles of artistic equipment.

Note 323. From Schmidt.

370

IV. Lesser Architectural Works.

Chapter 13. Wells and Fountains.

340. Shafts of Cisterns and Wells.

There yet remains a series of small ornamental structures for us to describe, whose purpose was connected with the life of the citizens. First are the wells. Very ancient is the arrangement of cisterns, where men were exclusively dependent
371 on rain water, as well as the excavation of shafts to such a depth, as to collect therein not merely the rain water falling on the earth, but also the water flowing underground and trickling from sand and stone. According to the quantity of water, that could and must be collected so as to hold out till the next rainy period, the cistern was a more or less extensive structure or excavation, which for coolness was preferably constructed under buildings like a cellar. They had an opening above like a shaft (Fig. 411). The water was drawn out through this. During the middle ages this was done by b buckets, which were let down. Such well shafts with openings were everywhere in cities and villages on open places and streets, as well as in the courts of the dwellings. A round or square curb surrounded the opening of the shaft. For the older wells, as they have remained in Italy and elsewhere, for example in Venice, these curbs are frequently decorated richly by ornaments and figures in sculptor's work, preferably t treated in the form of great capitals of columns. There men simply lowered the bucket on a chain or rope with a free hand over the edge and drew it up again filled. We indeed have to assume, that this was not different from what it was in Italy. But this method had its inconveniences and difficulties; therefore men hit on the idea of erecting two pillars beside the well, connecting these by a wooden beam, suspending below the latter a pulley, over which ran one chain with two buckets, thus using one bucket as counterweight for the other, since these must have a certain weight in order to sink into the w water. While the filled one was drawn up, the other passed down to be filled, thus also saving time. Such wells could be arranged in his own house by each but moderately well to do man, and such are also found in each large house, at least in the late middle ages, unless two neighbors combined to ar-

arrange a common well in the wall separating their grounds. (See the Plate next p. 162). Richer forms were also developed from this, when the wooden beam was replaced by a stone beam, for example as shown on a charming well from Montreal (Yonne)[326]. Likewise solutions with three supports and a richer superstructure occur. Finally the art smith took possession of the promising problem and constructed the support of the pulley like a portal, or ornamentally and charmingly in the form of a circular substructure of iron. An example from the Hospital in Beaune in Fig. 449 [324] is taken from Verdier and Cattois' frequently mentioned work.

Note 324. From Verdier and Cattois. Architecture civile et domestique. Pl. 1. Paris. 1855.

Note 325. From Baudenkmäler der Stadt Braunschweig. Brunswick. 1901.

Note 326. See Viollet-le-Duc. Vol. 7. p. 569.

341. Running Fountains.

But there had also been preserved the tradition from the R Romans to enclose springs, conduct the water in pipes, and t then to permit it to flow out at certain definite places, whe - re running fountains were erected. Such flowing fountains a
373 are then found in public squares, in gardens, as well as in
374 enclosed rooms, for example in the before mentioned fountain houses of the monasteries.

They gave opportunity for the erection of works, which in part have great artistic importance. Very much varied are t the forms, that men found for the always similar problems. Soon were they niches in facing walls, from which the water spouted into a basin placed before it, such as we find in costly execution in Schwäbisch-Hall. There a wall richly adorned by figures and niches forms the market fountain with several jets beside each other; before it is found a great rectangular water basin intended for watering animals; an unusually gracefully treated pillory column terminates the entire arrangement at the right, detached side. -- Massive vaulted porches were also frequently erected over the water basins, as at the famous Fonte Gaya in Siena. -- A very characteristic form from the year 1497 may be seen in Kuttenberg in Bohemia. There the nucleus of the fountain is formed by a massive det-

detached basin about 32.8 ft. diameter with side walls about 13.1 ft. high, ornamented by rich tracery and buttresses, evidently intended for storing a supply of water in a dry time or in case of siege. Around on its high base are then placed taps for drawing off the water. -- By far most commonly the design consists of a central shaft, around which lie one or more water basins. One of the oldest remaining in Germany is the Market Fountain in Goslar with two bronze bowls over each other, the middle portion richly constructed in cast l lead and rising from a plain base like a tower. With these bowls over each other we find one of the most beautiful examples standing on the marketplace in Brunswick (Fig. 450 [325]), also still from the 14 th century in its first half. Likewise the running fountain in the cloister of Maulbronn (Fig. 451), also still from the 14 th century, possesses three basins above each other (Fig. 49).-- In later times it was quite generally limited to one basin, which on each side afforded a sufficient supply of water for extinguishing fires; o
375 only the middle column was made as massive as possible with a rich finial with architectural and figure ornamentation. To this kind belong the Fountains at Basle, Ulm, Esslingen etc., which were erected in the 14 th century. Perhaps the most famous and also the grandest of all is the "Beautiful Fountain" erected at the close of the 14 th century on the market place in Nuremberg, a rich and architecturally treated pointed column 65.6 ft. high, whose magnificent effect w was materially heightened by animated painting and gilding of the ornamental parts.(Fig. 452 [327]).

Note 327. From a drawing by P. Ritter, text by R. Bergau in Zeits. f. Bauw. 1871. p. 217, 343; Pls. 44, 45.

Also on drawings, engravings and paintings, that remain to us from the middle ages, occur notable representations of f fountains. Fig. 453 gives such an architecturally treated fountain, decorated by lions ejecting water, from a hand drawing washed in color in the Germanic Museum at Nuremberg, from the close of the 15 th century. It is designed in stone, the middle portion perhaps in bronze; yet after the mediaeval fashion, the drawing does not give the exact treatment of the forms. Meanwhile the skilful architect would eas-

easily draw it in the correct forms. The sheet bears the c contemporary written designation; "the old beautiful fountain". But it cannot well with certainty be connected with that Nuremberg bearing the same name.

The so-called mediaeval "House-Book", an illustrated manuscript in the possession of the princes of Waldburg-Wolfegg from the close of the 15 th century, further contains on page 19 a and 24 b the two fountains represented in Figs. 454 and 455 [328], in two representations of gardens. The latter has a stone base, a basin not unlike a holy water stoup, but larger; according to the height of the figure appearing in the drawing, we have to assume for it a height of about 6.56 ft. The small figure that spurts the water upwards is thought to be of bronze, and a height of 3.28 ft. is assumed for it. On the contrary, we have to conceive the first fountain as somewhat smaller, perhaps 7.38 ft. high, but made of cast bronze, the three figures of children being only about 10 i ins. high.

Note 328. Mittelalterliche Hausbuch. Illustrated manuscript of the 15 th century. With a preface by Dr. A. Essenwein. Frankfurt-a-M. 1887.

376 Similar in dimensions is the small bronze fountain in S. Wolfgang (upper Austria), which is represented in Fig. 456 [329]. Without the stone steps it has a total height of 9.5 ft.; lions' heads, as such usually are, together with other fanciful animals' heads, following the classical tradition, served through the entire middle ages as outlets, and also here pour water into the basin.

Note 329. From publications of Wiener Bauhütte.

Chapter 14. Memorial Pillars and Crosses.

342. Memorial Pillars.

Other little structures are formed by memorial pillars, w which were erected here and there on the streets and squares of cities, as well as on the country roads outside them, and many of which are preserved to us. They all agree in this, that they either recall a definite event or the importance of the place whereon they stand, making it clear to the passer. In the earliest time it appears to have been preferably a cross, that was placed occasionally on the capital of a column of greater or lesser height. Such a cross still s stands on the market place at Treves. Coosses were also erected on the streets of Paris toward S. Denis at which king Philip the Bold halted, when he bore on his own shoulders t the remains of his ancestor S. Louis to S. Denis.

Later with the development of the Gothic style, there appeared richly treated finial structures like towers, corresponding to the finials of the buttresses on the churches, in place of pillars. The cross flower, that crowned the whole, may then be regarded as the indication of the cross, earlier forming the principal part. Entirely in the sense of those buttress forms was added rich figure ornament. The most beautiful memorial pillar of such a kind, developed in the best proportions, is that near Godesberg and not far from Bonn, which is known under the name of Hochkreuz (high cross). O One may well assume, that it indicates the limit of the city domain. The same significance was likewise possessed by that memorial pillar, which under the name of the "Spinner at the Cross" stands near Wiener-Neustadt, a memorial pillar built on a plan with three sides, which belongs to the close of the 14 th century and perhaps extends even to the beginning of the 15 th century. The elevation on the adjacent P Plate (at a scale of 1 to 100) of the pillar is nearly 72.2 ft. high, and we give 5 horizontal sections in 4 planes, by which it may be seen how the architecture is developed upwards. -- The Zderal pillar in Brünn (Fig. 458 [329]) is considerably smaller and simpler, but nowise beautiful in its upper solution.

343. Crosses.

343. Crosses.

But the cross retained itself its importance beside these architectural forms. Since men desired to consecrate the p place by erecting it, because by the symbol greeted by every one, they had the greatest security that the place would not be disturbed, and that the memory of its significance should be permanently retained, as therefore were employed with the architectural forms figures of saints and representations f from the life of Christ, to invite the offering of a prayer, so the cross continued in all times the most suitable form of the stone memorial. We give in Fig. 459 [330] one such from Belpech, which with its stepped base has a height of 17.6 ft., showing a crucifix group on the front and the Madonna on the rear.

Note 330. From Viollet-le-Duc. Vol. 4. p. 439. 1860.

344. Statues.

Besides the designation of border marks, for which the pillars previously treated served as public memorials, there w were likewise stone memorials of a different kind. Great is the number of smaller pillars, after so many have disappeared, which are known under the name of "statues", "martyr crosses", and the like, in varied artistic treatment, but also as rude crosses sunk in the earth along the country roads. They mostly designate the places, where a misfortune occurred or a crime was committed, and were partly erected by the criminals as indications of the sin, or by those saved as tokens of gratitude to God, or by the relatives or friends of the unfortunate, to request for him the prayers of the p passers. Aside from the wooden very temporary memorials, t they are more or less simple stone pillars, which bear ornamental projections on one or more sides. These are either shaped as canopies, so that they receive a group of figures, or are furnished with a niche containing a single saint, or finally are adorned by reliefs on each side. The later Gothic was inexhaustible in the development of ever novel motives; the land of Franconia is particularly rich in these little memorials of popular art.

A special group of these monumental pillars is composed of the Roland columns, which according to a not entirely clear

predecessor in the 15 th century in the representation of p play figures, that served as targets for lances, won importance as marks of city jurisdiction, and in Germany frequent-
379 ly stood before the city halls. In them the figure of the knight became more prominent in comparison with the architecture, than is the case for the small figures of saints on boundary columns or racks. The best known and probably the oldest of all is that at Bremen from the first half of the 15 th century, on which the architecture of the pillar itself is very mutilated; the littleness of the treatment shown by the canopy, which remains directly over the colossal figure, gives the scale at which we may conceive the upper end to have been developed. This must have been intended for a greater height of at least 19.7 ft., so that it is to be assumed, that the total height was little inferior to that of the Beautiful Fountain at Nuremberg.

345. Other Memorials of Rights.

If these Roland pillars are memorials of rights, then we have to mention still others. The absolute publicity of all proceedings of justice caused, that in many places, just as the open palace eventually became an enclosed hall, courts were held under the open sky. Such a place, where judgment was given in the open air, may have been the so-called king's seat at Rhense on the Rhine: an octagonal vaulted hall structure with an upper platform enclosed by a parapet, to which ascended a stairway, also of stone.

Another memorial of justice is the pillory, an example of which has already been mentioned; the Gothic stone column a adorned by a canopy and at the angle of the market fountain at Schwabisch-Hall, which served for the exposure of criminals, and showed there the undeserved glorification by rich decorative architecture. A great number of these pillories or scourging columns remain from the middle ages, for example in Breslau, Posen etc.; but they are entirely of a simple character.

Final Considerations.

We have attempted in the preceding to give a survey of the rich domain of mediaeval domestic architecture; but we shall not conceal from ourselves, that the nature of the material

makes it more difficult than in other domains, to obtain a
380 sufficient view from such a recapitulation. In our province,
besides the great general tendencies, which we have endeavor-
ed to emphasize, the individualities of the countries and p
peoples, indeed those of certain owners of buildings influe-
nce the development incomparably more, than in church or de-
fensive architecture. The result of this is an abundance of
results and of tendencies, interlacing and intermingling wi-
th each other in details often complicated in a high degree,
and which would require much more than the space at our com-
mand for a thorough treatment. Thus we have been compelled
to limit ourselves everywhere to the mention of a few proofs
and allusions, wherein for evident reasons the German devel-
opment was particularly treated. It lies in the nature of
such a presentation, that in it most examples must be prefer-
red in the selection, by which characteristic contemporary
tendencies may be illustrated. In addition thereto it shou-
ld at least be stated here, that most mediaeval dwellings f
find their effect in simple proportions, and that in partic-
ular nothing was further from the nature of the mediaeval c
city architecture, than to distract attention from the great
masses and lines by the heaping of ornament and of striking
decorations. If occasionally on the quiet background of pl-
ain works was prominent a richer solution, the dignified as
well as picturesque peculiarity of mediaeval secular archit-
ecture required this. To describe such effects connectedly
lay outside the problem set for us. To learn to recognize
them and also to penetrate into the infinite wealth of medi-
aeval domestic existence in some degree, besides the study
of books, it is necessary to occupy one's relf with the old
buildings, and to realize their characteristics and their
connection. We behold it as entirely an inartistic method,
if it be attempted to represent art material of any kind, e
even the most modern, on the basis of theoretical studies o
or publications, without knowing their effects and mode of
use from personal observation. And we beliewe that so much
weakness in the modern practice of art, in particular the u
undeniable failures of the use of historical styles must be
referred to ignorance of the mode of working in those earlier

times. So much the more is it for us at the close of our s statement of an impartial personal study of the old works, to indicateithem as the inexhaustible source of fresh artistic inspiration. It is an extremely rich and interesting domain, that lies before us in the works of mediaeval domestic architecture as still in great part a new land; no one will occupy himself with it without enjoyment, or without a artistic and scientific benefit. An introduction to the chief tendencies, basal for the understanding of connections, and not the presentation of pleasing models for imitation, is the purpose of the preceding work.

And in closing, may the hope be expressed, that our descriptions may thus give to many the impulse to more active participation in so many questions of an artistic, technical and scientific nature requiring further development, which everywhere obtrude themselves in the consideration of mediaeval domestic architecture.